THE CHRONOLOGY OF EZRA 7

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A REPORT OF THE HISTORICAL RESEARCH COMMITTEE OF THE GENERAL CONFERENCE OF SEVENTH-DAY ADVENTISTS

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Preface

SOME YEARS ago the General Conference of Seventh-day Adventists set up a committee, later called the Historical Research Committee, to study certain problems of historical dating that relate to prophetic periods, and to engage in scientific research where it seemed necessary. One of the problems studied by the committee was the date for the seventh year of Artaxerxes. The evidence secured, as set forth in the following study, furnishes indisputable proof that the date accepted by the early pioneers of the Advent message was accurate from a scientific as well as from a Biblical viewpoint.

Since the committee members were occupied with regular denominational responsibilities, the work was necessarily carried on intermittently, with intensive work done by a few from time to time. Special tribute should be paid to Lynn H. Wood, a charter member of the committee, who has done most of the basic research on the problems involved in this report. He has contributed very important principles and calculations, and has indicated the direction the research should take and the probable methods by which the solutions might be found. Grace E. Amadon, who passed away in 1945, contributed also to the early studies, especially in Jewish calendation.

At the request of the committee this report has been written by Siegfried H. Horn, by whom two recently

discovered source documents have been brought to bear on the problem. He was ably assisted in this task by Julia Neuffer. However, the report is based on the work of all the members, and the final product represents the united conclusions of the committee.

A word of thanks is due Edwin H. Thiele, professor of Bible and religion, Emmanuel Missionary College, for his critical examination of this report and his concurrence in the conclusions reached.

During the years this committee has been functioning, its personnel has changed from time to time on account of routine assignments to other duties, retirement from active service, and death. Special mention should be made of LeRoy E. Froom, who served as chairman from 1939 to 1943; and Milton E. Kern, who served as chairman from 1943 to 1950. Under their able direction the committee did a large share of its work.

It is with some measure of satisfaction, and a feeling of gratitude to God for His blessing upon our labors, that this report on the basic date of the 2300-day prophecy is presented.

THE HISTORICAL RESEARCH COMMITTEE
OF THE GENERAL CONFERENCE OF
SEVENTH-DAY ADVENTISTS.

Walter E. Read, *chairman;* Merwin R. Thurber, *secretary;* LeRoy E. Froom, Siegfried H. Horn, Milton E. Kern, Frederick Lee, Julia Neuffer, Denton E. Rebok, W. Homer Teesdale, Lynn H. Wood, Frank H. Yost.

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List of Abbreviations

AJSL	= *The American Journal of Semitic Languages and Literatures.*
AP 1, 2, etc.	= Papyri in Cowley, A. *Aramaic Papyri of the Fifth Century B.C.*
BASOR	= *Bulletin of the American Schools of Oriental Research.*
CAH	= *The Cambridge Ancient History.*
JNES	= *Journal of Near Eastern Studies.*
Kraeling 1, 2, etc.	= Papyri in Kraeling, Emil G. *The Brooklyn Museum Aramaic Papyri.*
sr-sr	= Sunrise to sunrise.
ss-ss	= Sunset to sunset.

Introduction

The purpose of this study is to examine the chronological basis of the time prophecy of the 2300 days of Daniel 8:14. Seventh-day Adventists for over one hundred years have given an important place to the prophecy of the cleansing of the sanctuary in the time of the end (Dan. 8:14, 17), after 2300 prophetic days. They have identified the starting point with the beginning of the seventy weeks (Dan. 9:24-27), at "the going forth of the commandment to restore and to build Jerusalem," and like many prophetic expositors before them, located this in the time of Ezra, who journeyed from Babylon to Palestine "in the seventh year of Artaxerxes the king" (Ezra 7), an event that had long been dated in 457 B.C. by Biblical expositors generally.

The fall of 457 was taken as the time when this decree of Ezra 7 became effective, hence the point of origin from which the 2300 years were reckoned. Seventh-day Adventists had originally taken over the dates (though not the interpretation of the closing events) of the 2300-year prophecy from the Millerites and other earlier expositors, and so have continued to use them.

But since that time, particularly in recent decades, notable advances have been made in the knowledge of ancient times. Thousands of original documents have been unearthed, many of which bear witness to historical narratives of the Scriptures and throw light on Bible

chronology. A much more exact knowledge of ancient calendars and dating systems has been derived from dated business documents—contracts, deeds, receipts, et cetera—written on clay tablets in Babylonia and on papyri in Egypt. As a result, many uncertain points of chronology have been cleared up.

Since the historical and chronological basis for explaining dates used in connection with prophecies was derived from older authorities, standard in their day, but now rendered obsolete by newer discoveries, it has become necessary to examine ancient documents now available that might throw light on the Biblical history and chronology, in order to have the benefit of the most recent and reliable information.

This study is concerned with the examination of the basic date of the prophetic 2300-day period—457 B.C.—in the light of this new evidence. Most currently used Bible commentaries and works on ancient history that date Ezra's return from Babylon give 458 instead of the older 457 B.C. To present the results of this investigation, which show that our dating of this event has been correct, is the purpose of the present work.

But before the reader can understand the application of the chronological data to the problem, or evaluate the conclusions drawn, he must become acquainted with the basic elements of the ancient methods of dating, which are different from our own.

In order to proceed from the known to the unknown, let us begin with a look at our own dating system. The month names January, February, March, and so on,

are Roman, and the 365-day year was introduced into Europe from Egypt by Julius Caesar, who added the leap-year feature. This "Julian" calendar, inherited by the nations which succeeded the Roman empire, has come down to us in a slightly corrected form called the "Gregorian" calendar. This, along with the B.C-A.D. system of year numbering, originating in medieval times, has spread over the globe with the European expansion until it has become familiar even in remote countries that have entirely different calendars of their own.

Thus a large part of the world today is accustomed, not only to the dating of modern happenings in terms of the Gregorian calendar and the Christian era, but also to the historical dating of all ancient events as if the Julian calendar and the B.C. scale of years extended backward indefinitely into the remote past. We say, for example, that Jerusalem fell to Nebuchadnezzar in 586 B.C., that Cyrus died in August, 530 B.C., and that Alexander the Great died in June, 323 B.C. Having become accustomed to such a system of dating, we find it hard to realize that the original records from which we learn about these and other ancient events are given in various dating systems quite different from ours.

Let us briefly review the evidence for the three mentioned dates and see how each one is based on chronological evidence different from the others. For the fall of Jerusalem we have the Bible statements dating it in the 19th year of Nebuchadnezzar and the 11th year of Zedekiah. Nebuchadnezzar's 19th year happens to

be more easily located than many others, because archeologists have found a document from the time of Nebuchadnezzar giving a series of astronomical observations for his 37th year that locate that B.C. year unmistakably, and therefore also the 19th year. However, we must also know the relationship between Nebuchadnezzar's Babylonian years and Zedekiah's Jewish years in order to be sure of the date for the fall of the city. For the death of Cyrus the Great we have Ptolemy's Canon and a contemporary eclipse record which necessitate placing the first year of his successor, Cambyses, in the spring of 529 B.C., following Cyrus' 9th Persian year. Other Babylonian tablets indicate the time of year at which his reign ended. For Alexander's death a record exists that dates the event in the 1st year of the 114th Olympiad, a Greek dating used in the classical period.

Such various types of dating formulas in different calendars, often more variable and less exact than the ones mentioned, must be pieced together by careful and sometimes laborious methods in order to date ancient events. Some can be located exactly in the B.C. scheme of dating, and others only approximately.

The necessity of understanding these problems becomes obvious when we consider the case of the historical events connected with the starting point of the prophetic 2300-day period: Ezra's journey to Jerusalem lasting from the 1st to the 5th month of "the seventh year" of the reign of Artaxerxes. The date is given in terms of a regnal year of a Persian ruler

as reckoned by a Jew from Babylon who was writing for Palestinian Jews about events connected with Palestine. In order to assign these events with certainty to a B.C. date, we must answer a number of questions: What did Ezra mean by the 1st and the 5th month, and what kind of calendar did he use? What did he mean by dating his return to Jerusalem in the 7th year of the reign of King Artaxerxes? Did he reckon it from the date of accession or by calendar years? If the latter, did he use Persian or Jewish years, and if Jewish, which of the systems known to have been used by the Jews? Such varied elements enter into the problem of locating ancient events in the B.C.-A.D. scale. Therefore the first four chapters will be devoted to a basic explanation of the necessary facts about ancient dating methods that are essential for a correct interpretation of Biblical dates in general and those connected with the 2300-day prophetic period in particular.

A careful study of the first two chapters is therefore indispensable for an understanding of chapters 3 to 5 dealing with the specific problems of the Jewish calendar and the chronology of Ezra 7, and the Appendix presents a detailed discussion of some extra-Biblical Jewish documents of the 5th century B.C. by which the correctness of the conclusions reached in chapter 6 is established. For an understanding of the solution of the problem discussed, a reading of the Appendix is not essential, but this material is included for those who want to have all the evidence on which our knowledge of the Jewish calendar of the 5th century B.C. is based.

Different Dating Systems

THE NECESSITY of dating certain events was felt from very early times. Thus we find not only in the early records of the Bible, but also in those of other ancient nations, various means employed to date events. The most ancient records of Mesopotamia reveal that economic reasons were responsible for the invention of systems by which time could be fixed; for instance, to determine how much rent had to be paid for the loan of an animal for a certain period of time, or for the rent of a house, et cetera. However, the ancients did not know how to reckon time according to an era, as we moderns are accustomed to doing, an era that has a fixed point of departure (as the birth of Christ in the Christian era), and that assigns to each new year a new number without any interruption and without regard for events.

Lists of Year Names

The earliest known way of fixing a chronology, as practiced by the ancient Sumerians and Babylonians, was to give a name to each year, the name of the most conspicuous event of the previous year. In this way the 7th year of Hammurabi, for example, was called the

"year Uruk and Isin were taken,"[1] and the 10th year of his reign was called the "year the army and people of Malgu were destroyed," although in both cases the actual events referred to had happened in the respective preceding years. In the various offices and cities were kept complete lists of all year names covering a reasonable period, so that it could be determined how many years had passed if a man claimed, for instance, that someone owed him rent for a piece of land from the "year Uruk and Isin were taken" to the "year the army and people of Malgu were destroyed." From such lists it could be determined that between the two aforementioned years lay the two following ones: (1) the "year the land of Emutbal (was?) [destroyed]," and (2) the "year the canal Hammurabi-hegal (was dug)." Although such reckoning of time seems very cumbersome to us moderns, who without a moment's hesitation know how many years lie between 1950 and 1953, this reckoning according to year names was practiced for many centuries in Mesopotamia.

Eponym Canons

Another method of fixing years was introduced by the Assyrians. A high official, including the king, was appointed once during his life, to serve for one year as *limmu,* which was an honorary office requiring the performance of no duties, but merely giving his name to the year in which he was *limmu.* The Greek equiva-

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[1] The examples of all year names are taken from Samuel A. B. Mercer, *Sumero-Babylonian Year-Formulae,* pp. 35, 36.

lent of the Assyrian *limmu* is the word "eponym"; hence the chronological lists containing the names of the *limmu* are called Eponym Canons.[2] Thus we find in the year when king Sargon II came to the throne an eponym by the name Nimurta-ilaia, and all the documents were dated during that year in "the year Nimurta-ilaia." This eponym was followed the next year by Nabu-taris, and every dated document bore the entry "the year Nabu-taris."[3] Lists of the eponyms, like the lists of the year names in early Babylonia, had to be kept for business or legal purposes. This system of time reckoning was employed by the Assyrians from about 2000 B.C. to the end of the empire's existence in the late 7th century B.C.

Regnal Years

In Egypt dating was done, from the earliest historical times, according to years of the reign of each king, called regnal years. This system was also introduced in Babylonia by the Kassite rulers in the middle of the second millennium B.C. Since this form of time reckoning is the one encountered in the documents, Biblical and extra-Biblical, with which this study is concerned, this system has to be explained in somewhat greater detail than the previously mentioned systems, which have no bearing on the subject under discussion.

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[2] A. Ungnad, "Eponymen," *Reallexikon der Assyriologie*, vol. 2 (1938), pp. 412-457; see also Sidney Smith, "The Foundation of the Assyrian Empire," and "The Age of Ashurbanipal," in *The Cambridge Ancient History* (hereinafter abbreviated to *CAH*), vol. 3, pp. 3, 92, 93.

[3] Ungnad, *op. cit.*, p. 424; Daniel D. Luckenbill, *Ancient Records of Assyria and Babylonia*, vol. 2, p. 437.

To the average person today the expression "first year of Darius" would naturally mean the first twelve months of his reign, beginning from the date of his accession to the throne. Indeed, in this way—counting by anniversaries of the accession—the years of the British rulers are reckoned, and by such regnal years the laws of the empire are dated.[4] But in everyday life it is much more convenient to date by calendar years that always begin on the same date, and are numbered by a long-term scale, like the Christian era.

During the period of the Babylonian and Persian kings with which the first part of this study deals, formulas such as the following are found: "in the month Nisan, in the twentieth year of Artaxerxes the king" (Neh. 2:1). But the ancients had two methods by which they avoided the troubles inherent in counting years by each ruler's anniversaries. Disregarding the varying dates of the actual accessions, they reckoned all reigns so as to make the regnal year coincide with the calendar year. The difference between the two methods by which this was done was in the treatment of the interval between the day of a king's accession to the throne and the next New Year's Day.

Accession-year reckoning (postdating).—Under the accession-year system of counting regnal years the unexpired portion of the calendar year in which a king's reign begins is called his accession year. Then his first full year, coinciding with the next calendar year, is numbered "year 1." The Assyrians, the Babylonians,

[4] Frederick C. Hicks, *Materials and Methods of Legal Research*, p. 430.

and the Persians after them, used the accession-year system.[5] Some of the Hebrew kings also employed it, as can be determined by synchronisms between the years of contemporary kings of Israel and Judah.

To illustrate this method, let us suppose that a Babylonian king (A) dies in the 5th month of the 20th year of his reign, and is succeeded by his son (B). Archeologists have found dated contracts, letters, and other documents, written on clay tablets, covering this period. The documents of the first five months, up to the time of the king's death, are dated in the 20th year of King A. But a receipt, let us say, signed in the 6th month, will be dated "in the 6th month of the accession year (literally "the beginning of kingship")[6] of King B." During all the rest of that calendar year the scribes will be dating documents in the accession year of the new king. Then on the first day of the new year they change to a date formula which reads, "in the 1st month of the year 1 of King B."[7] The use of the designation "year 1" has been deferred until the New Year's Day following the accession.

This system, often called postdating because the beginning of the 1st regnal year is being postponed,

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[5] See Richard A. Parker and Waldo H. Dubberstein, *Babylonian Chronology, 626 B.C.-A.D. 45*, pp. 9-17.

[6] Arno Poebel, "The Duration of the Reign of Smerdis, the Magian, and the Reigns of Nebuchadnezzar III and Nebuchadnezzar IV," *The American Journal of Semitic Languages and Literatures* (hereinafter abbreviated to *AJSL*), 56 (1939), p. 121.

[7] For the Nisan beginning of the regnal years, see the sequence of the observation dates in an astronomical text of the time of Nebuchadnezzar, in Paul V. Neugebauer and Ernst F. Weidner, "Ein astronomischer Beobachtungstext aus dem 37. Jahre Nebukadnezars II. (-567/66) [i.e. 568/67 B.C.]," *Berichte über die Verhandlungen der Königl. Sächsischen Gesellschaft der Wissenschaften zu Leipzig.* Phil.-Hist. Klasse, 67 (1915), part 2, pp. 34, 38.

makes the regnal years coincide with the calendar years, and avoids giving two numbers to the year in which the accession takes place. Thus the calendar year which has begun as the 20th of the father is followed by the year 1 of the son. The distinguishing mark of this system is the term "accession year," applied to the interval lying between the accession of a king and the first New Year's Day, after which his nominal 1st year begins.

Non-accession-year reckoning (antedating).—The opposite method of counting regnal years, employed at times in Egypt,[8] and also indicated in the Bible, has no "accession-year" designation. Documents written in the unexpired portion of King A's last year begin immediately to be dated in King B's "year 1," and on the first New Year's Day the dating changes to the year 2 of the reign. This method has the disadvantage of causing an overlap in numbering, a double dating for the year in which the reigns change, for that year bears the last number of the old king and also the number 1 of the new one. This system is often called antedating.

Therefore, if the same reign is reckoned by different chroniclers using the two systems—as is sometimes the case in the records of Judah and Israel[9]—the year numbers as recorded in the accession-year system will run a year later than those reckoned according to the non-accession-year system, as Figure 1 will show.

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[8] Richard A. Parker, "Persian and Egyptian Chronology," *AJSL*, 58 (1941), pp. 298, 299.

[9] See Edwin R. Thiele, *The Mysterious Numbers of the Hebrew Kings*, pp. 19-29.

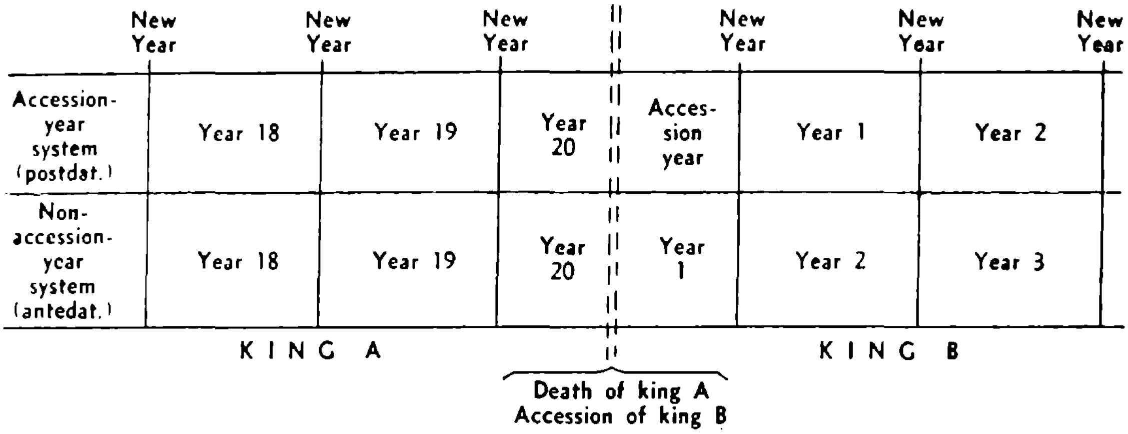

Fig. 1.

Further, it should be noted that in totaling a list of reigns reckoned according to the accession-year system the sum of years recorded for each king is the same as the actual number of years elapsed, whereas in adding a succession of reigns reckoned according to the non-accession-year system, a year must be subtracted for each king, because the last year of one reign and the first of the next are really the same.

In dealing with Biblical records, it is necessary to know in each case which of these two regnal systems is used—the accession- or non-accession-year systems.

A clear case of reckoning a king's regnal years according to the accession-year system is given in 2 Kings 18:1, 9, 10. After having stated that Hezekiah came to the throne in the 3d year of Hoshea, the writer declares that the siege of Samaria began in the 4th year of Hezekiah, which was the 7th year of Hoshea, and ended three years later in the 6th year of Hezekiah, which was the 9th year of Hoshea. The two possible reckonings of Hezekiah's reign would give the following results:

1. According to the non-accession-year system (antedating) :

Year 1 of Hezekiah	- -	Year 3 of Hoshea
Year 2 " "	- -	Year 4 " "
Year 3 " "	- -	Year 5 " "
Year 4 " "	- -	Year 6 " "
Year 5 " "	- -	Year 7 " "
Year 6 " "	- -	Year 8 " "

2. According to the accession-year system (post-dating):

Accession year of Hezekiah		Year 3 of Hoshea
Year 1 " "	-	Year 4 " "
Year 2 " "	-	Year 5 " "
Year 3 " "	-	Year 6 " "
Year 4 " "	-	Year 7 " "
Year 5 " "	-	Year 8 " "
Year 6 " "	-	Year 9 " "

From this it can be easily seen that Hezekiah must have used an accession-year system. On the other hand, a clear example of non-accession-year reckoning is the reign of Nadab of Israel, who came to the throne in the 2d year of Asa of Judah. Nadab reigned two years, and was killed in the 3d year of Asa (1 Kings 15:25, 28). The two possible reckonings of his reign would run thus:

1. According to the accession-year system (post-dating):

Accession year of Nadab	Year 2 of Asa (latter part)
Year 1 " "	Year 3 " "
Year 2 " "	Year 4 " "

2. According to the non-accession-year system (ante-dating):

Year 1 of Nadab	- -	Year 2 of Asa (latter part)
Year 2 " "	- -	Year 3 " "

Obviously the non-accession-year system, and not the other, fits the record; for after having come to the throne in Asa's 2d year, the king reigned two years—that is, his death occurred in his 2d year—and died in the 3d year of Asa. A chronicler who recorded Nadab's accession in the 2d year of Asa could not consistently have given him an "accession year," a "year 1," and a "year 2," in two consecutive years. There are other similar examples of non-accession-year reckoning in the Bible.[10] These examples and others that could be cited show that the Hebrews used both systems at different times.[11]

It is necessary to know which system is involved if a regnal date of any king is to be located in the B.C. scale of the Julian calendar. This is so because, even if the exact B.C. date of a king's accession is known, his regnal-year numbering will run one year later if reckoning is made according to the postdating or accession-year system than if it is done according to the ante-dating or non-accession-year system. These differences between the types of regnal-year reckoning in

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[10] See 1 Kings 16:8, 10; 22:40, 51; 2 Kings 1:1, 2, 17; 3:1. A supposed difficulty in reckoning twelve years from Ahab to Jehu, spanning 2 intervening reigns of 2 years plus 12 years, is cleared up by the application of this method. See S. A. Cook, "Chronology: II. The Old Testament," *CAH*, vol. 1, chap. 4, sec. 2, p. 160.

[11] See Thiele, *op. cit.*, pp. 38-41.

relation to the accession date must be understood in order to interpret correctly the dated source documents of the reigns of Xerxes and Artaxerxes. Three other types of year numbering, less important to the problem than the contemporary regnal-year datings, have been used by later writers in connection with the accession of Artaxerxes—the Greek archonships and Olympiads and the Roman consular dating.[12]

Archon List

Among the Greeks the various city states had no more uniformity in their respective calendars than they had political unity. The Athenians designated each year by the name of the archon, or chief magistrate, for that year.[13] They used their archon list as the Assyrians used their Eponym Canon, but a difference existed between the archons of Athens and the Assyrian eponyms, because the former always held the same office, whereas the latter consisted of various dignitaries of the Assyrian Empire, for whom the office of eponym was an honorary one.

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[12] Diodorus Siculus (xi. 69; Loeb ed., vol. 4, p. 305) places the death of Xerxes in the year when Lysitheüs was archon in Athens and the two consuls elected at Rome were Lucius Valerius Publicola and Titus Aemilius Mamercus. Eusebius in his *Chronica* places it in the 1st year of the 79th Olympiad. These conflicting datings have been used in earlier attempts to date the accession of Artaxerxes I, but it is unnecessary to demonstrate here that only one of these is correct, namely, the archonship of Lysitheüs (placed in B.C. 465/4, from summer to summer, by F. K. Ginzel, *Handbuch der mathematischen und technischen Chronologie*, vol. 2, p. 587, Tafel VI). The dating of the death of Xerxes and the accession of Artaxerxes does not depend on doubtful texts of later historians who themselves had no access to contemporary sources; it is completely established by archeological finds —original dated documents that have come to us directly, as it were, from the scribes who wrote them in the time of Artaxerxes.

[13] E. A. Gardner and M. Cary, "Early Athens," in *CAH*, vol. 3, pp. 590-593; on the archon lists see William Bell Dinsmoor, *The Archons of Athens in the Hellenistic Age*.

Olympiads

Besides the Athenian scheme of reckoning, there was another, used by all the Greeks—the Olympiads, the four-year periods between the Olympic games. The sacred festival at Olympia, celebrated once every four years, was the one occasion when all the Greek states put aside their feuds and united in joyous celebration. Thus the dating of the Olympic games was important to all, and eventually the practice arose of dating an event in a certain year of a certain Olympiad. It should be noted that the 1st year of the 1st Olympiad is 776/5 B.C., from midsummer to midsummer,[14] since, traditionally, the first Olympic games were held in the summer of 776 B.C. The fact that this date is only traditional[15] does not impair the usefulness of the chronological scale any more than the error of a few years in the actual birth date of Christ affects the value of the Christian era for dating purposes. Olympiad dating was used by Greek and Roman classical writers, and also by Josephus. The formula "in the 4th year of the 85th Olympiad" is sometimes abbreviated to Ol. 85. 4.

Consular List

The Romans most often used for dating purposes the method of designating the year by the names of

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[14] The double date 776/5 is given here to call attention to the fact that the Olympiad years and all ancient calendar years (except the Roman, which we still use) overlap parts of two of our present calendar years. The practice of writing such double dates as 776/5, which is becoming more common, is the only sure way of avoiding errors in expressing the B.C. equivalents of ancient calendar years.

[15] For theories about the dating of the Olympiads, see H. T. Wade-Gery, Chronological Note 3 on "Olympic Victor Lists," in *CAH*, vol. 3, pp. 762-764, *cf.* table, p. 767.

the two consuls, the highest Roman officials, appointed annually by the Senate.[16] "In the consulship of Lepidus and Arruntius"—literally "Lepidus and Arruntius being consuls"—was the official Roman formula, although in the time of the empire the eastern provinces applied their older regnal-year system also to the emperors.[17] In the later Roman period Fasti, or lists of officials, including the consuls[18] became standard chronological scales like the archon list of Athens.

Era of the Foundation of Rome

The Romans also developed a true historical era beginning with the traditional founding of the city, generally placed at 753 B.C.[19] This reckoning *ab urbe condita,* or *anno urbis conditae,* abbreviated to A.U.C., is sometimes counted from April 21, which came to be celebrated as the birthday of Rome,[20] though at times from January 1, the beginning of the ordinary Roman calendar.[21] It was used less often for dating purposes than the consulship formula. Although the

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[16] H. Stuart Jones and Hugh Last, "The Early Republic," in *CAH,* vol. 7, p. 437.

[17] An example is the date formula of Luke 3:1—"in the fifteenth year of the reign of Tiberius Caesar."

[18] The *Chronographus Anni CCCLIIII* contains one of these consular lists, entitled "Fasti Consulares," published in *Chronica Minora Saec. IV. V. VI. VII.,* ed. Theodor Mommsen, vol. 1 ("Monumenta Germaniae Historica," Auct. Ant. vol. 9), pp. 50-61.

[19] Roman historians differed in dating the founding of Rome, but the year most commonly accepted is from Varro, who lived in the first century B.C. See H. Stuart Jones, "The Sources for the Tradition of Early Roman History," in *CAH,* vol. 7, pp. 321, 322, and table.

[20] This was the festival of the Parilia, or Palilia. See Censorinus, *De Die Natale ("The Natal Day"),* chap. 10 (21), trans. William Maude, p. 32.

[21] Among other eras the current year A.U.C., reckoned from January 1, appears every year in *The American Ephemeris and Nautical Almanac.*

era ran theoretically from 753 B.C., it was not the oldest continuous era in length of use.

The Seleucid Era

One of the first eras actually used was that of the Seleucids, which was widely found throughout the Near East during the last three pre-Christian centuries. It began with Seleucus I's reign, reckoned from 312 B.C., and its years were continuously counted through—at least in some Eastern countries outside the Roman Empire—until the first Christian century. In the Macedonian calendar the years of the Seleucid era began in the fall, the 1st year having its beginning Dios 1 (October 7), 312 B.C. However, in the Babylonian calendar the years of the Seleucid era had their beginning in the spring, the first year having started Nisanu 1 (April 3), 311 B.C.[22] But these earlier eras were only forerunners of the Christian era, which is the basis for the modern dating that has spread over much of the globe. It is important to this study, because from its starting point modern historians reckon not only subsequent events but also, in the other direction, all past history in the B.C. dating scale. It is in terms of B.C. years that the regnal years of Artaxerxes and other Biblical date formulas are made understandable.

The Christian Era

In the earlier centuries of the Christian church much dissension was caused by the various attempts to

[22] Parker and Dubberstein, *op. cit.*, p. 18.

work out a satisfactory method of calculating the date of Easter. In the year now called A.D. 525, a monk named Dionysius Exiguus made a new 95-year Easter table to continue a current table that was soon to expire. He copied the last years of the other table, which were numbered by the era of the Emperor Diocletian, but being unwilling to preserve the memory of a notorious persecutor of the Christians, he labeled the first column of his continuing table "Anni Domini Nostri Jesu Christi," and numbered the first year 532.[23] From this came the dating formula "in the year of our Lord 532," et cetera (Latin, *Anno Domini,* abbreviated to A.D.).

Dionysius did not explain how he arrived at this particular year. Evidently he accepted a date for the birth of Christ that was already current, for it agrees with that given in the consular list contained in a Latin chronological work of the year 354, which puts Christ's birth in the consulship of C. Julius Caesar Vipsanius and L. Aemilius Paulus, or A.U.C. 754. (This consular year is A.D. 1.)[24]

The English historian Bede (A.D. 673-735) adopted this dating in his improved Easter tables, which became the standard basis for dating purposes in annals and histories; then the Frankish rulers and later the popes began to date official documents in the new era, but it came only gradually into common use.[25] Although

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[23] Dionysius Exiguus, *Liber de Paschale,* in *Dionysii Exigui* [*et al.*] . . . *Opera Omnia* ("Patrologia Latina," ed. J.-P. Migne, vol. 67), cols. 493-496; see also Charles W. Jones, "Development of the Latin Ecclesiastical Calendar," in his edition of *Bedae Opera de Temporibus,* pp. 68, 69.

[24] See *Chronographus,* p. 56.

[25] Charles W. Jones, *op. cit.,* p. 70; see also Reginald L. Poole, *Medieval Reckonings of Time,* p. 40.

Dionysius' dating of the birth of Christ was early recognized as erroneous, not all scholars to this day are agreed on what the correction should be.

As the Christian era was applied to historical dates, it was necessary to extend the scale of years backward. Events that had occurred in pre-Christian times were numbered as so many years before Christ's birth (abbreviated to B.C.). So the year preceding A.D. 1 was called 1 B.C., with no zero year between. As a consequence of this procedure, modern computation of ancient dates faces two inconveniences: (1) the year numbering before Christ runs in reverse, from larger to smaller figures, and (2) computations of intervals from B.C. to A.D. dates are hindered by the lack of a year 0; for example, a four-year lease made in 3 B.C. does not expire in A.D. 1, as would seem logical, but in A.D. 2. Astronomers have avoided this obstacle to computation by exchanging for the B.C and A.D. notation a scale of negative and positive numbers, as on a thermometer, calling the year preceding A.D. 1 the year 0, and the year preceding that, *minus 1*.[28] Thus 1 B.C. is the same as the astronomical year 0, 2 B.C. is —1, 3 B.C. is —2, et cetera, the *minus* number being always *one less* than the corresponding B.C. number. It is also to be noted that the leap years, which in our era are those divisible by 4, are not the same in B.C., but are 1, 5, 9, et cetera.

The following diagram illustrates the astronomical

[28] George F. Chambers, *A Handbook of Descriptive and Practical Astronomy*, vol. 2, p. 460.

and chronological reckoning, with the leap years marked by asterisks:

	*				*				*
Astronomical:	-4	-3	-2	-1	0	1	2	3	4
Chronological:	5 B.C.	4 B.C.	3 B.C.	2 B.C.	1 B.C.	A.D. 1	A.D. 2	A.D. 3	A.D. 4
			1	2	3	4			

The fact that the year −1 is 2 B.C., et cetera, has sometimes led to confusion. For example, many writers on the prophecies have computed the 70 weeks and the 2300 years by merely subtracting the B.C. date of the starting point from the total number of years to arrive at the A.D. ending date; but by doing this they inadvertently shorten the periods to 489 and 2299 years each instead of 490 and 2300.

The underlying principle can be illustrated by the imaginary four-year lease (see arrows on the preceding diagram) beginning some time in the year 3 B.C. (the astronomers' year −2). If one attempts to compute the date of the expiration of the lease by subtracting 3 B.C. from the total of four years, the result is A.D. 1 (4 − 3 = 1). But A.D. 1 is a year too early; a glance at the diagram shows that the four-year period would expire on the appropriate date in A.D. 2. The diagram thus demonstrates that simple subtraction of the B.C. date does not lead to the correct A.D. date. But the diagram reveals the fact that computation is simplified when the B.C. date is converted into its astronomical equivalent, −2; then −2 + 4 = 2 (or 4 − 2 = 2, which is the same thing) and the result is A.D. 2. Sub-

tracting the *astronomical equivalent*[27] of the B.C. date from the total number of years always yields the correct A.D. terminal date.

Many 19th-century writers on the prophecies began the 70 weeks and the 2300 years from the 7th year of Artaxerxes, and most of these calculated the periods as extending from 457 B.C. to A.D. 33 and 1843 respectively, overlooking the fact that they were one year short; only a very few avoided error on the B.C-AD. transition, and arrived at A.D. 34 and 1844 respectively.[28] Generally those who made the error derived their dates from Ussher's chronology as given in margins of the Bible, or from subtraction: $490 - 457 = 33$, or $490 - 33 = 457$. Some of them cited the 18th-century astronomer James Ferguson for the dates B.C. 457 and 33, not knowing that his "457 before Christ," written without a minus sign, was what astronomers now call —457, which is, according to the chronological system, 458 B.C. That Ferguson's dates were tabulated not in B.C. but in astronomical numbering is shown conclusively by his

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[27] Those who prefer this stated algebraically will notice that, since the astronomical equivalent of a B.C. date is a negative number, it is not strictly correct to say that the negative number is to be subtracted; algebraically it is added, since adding a negative number is the same as subtracting a positive number.

[28] For a tabulation of these prophetic expositors, see L. E. Froom, *The Prophetic Faith of Our Fathers,* vol. 3, p. 744. Even William Hales, writing a work on chronology, explained the B.C. to A.D. transition and then, later in the same work, tripped over the zero year, and computed the 490 years by subtraction from 420 B.C. to A.D. 70. See his *New Analysis of Chronology,* 2d ed., vol 1, p. 57; vol. 2, pp. 517, 518. The Millerites also made this mistake in the beginning, but later corrected their dates from A.D. 33 to 34 and from A.D. 1843 to 1844. For the basis of William Miller's computation see his *Evidences* (1836 ed.), pp. 49, 52; see further his manuscript "New Year Address" of 1844 reproduced in F. D. Nichol, *The Midnight Cry,* p. 160n and facsimile facing p. 192. For the correction see the editorial "Chronology" in *Signs of the Times* 5(1843), p. 123; A. Hale, "Diagram," and correction, *The Advent Herald,* 7(1944), pp. 23, 77; S. S. Snow, "Prophetic Time," *ibid.,* p. 69.

use of the zero year, to which he was accustomed in his astronomical computations.[29] But this use of the zero year and negative numbers is rarely encountered by any except astronomers. Historical works give dates in the ordinary B.C. scale that has no zero year. Fortunately the need of such a zero year is ordinarily not felt except in computing an interval from a B.C to an A.D. date.

After this survey of the various methods of counting years, two of which—the regnal-year systems and the B.C-A.D. scale—are vitally important for a correct dating of Ezra 7, the next step is to consider the types of ancient calendars that have a bearing on the problem.

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[29] Ferguson dealt with the 70 weeks as ending with the crucifixion, which he fixed by lunar calculation, according to the traditional Jewish calendar, at A.D. 33. See his *Astronomical Lecture, on . . . the True Year of Our Saviour's Crucifixion, . . . and the Prophet Daniel's Seventy Weeks;* for the zero year see "A Table of Remarkable Eras and Events," in his *Astronomy Explained Upon Sir Isaac Newton's Principles,* following sec. 396. The same table in his *Tables and Tracts, Relative to Several Arts and Sciences,* pp. 176-179, is followed by this sentence: "In this Table, the years both before and since CHRIST are reckoned exclusive from the year of his birth."

The fact that Ferguson's 457 is the ordinary 458 B.C. is shown also by other dates in the table (such as 775 instead of 776 for the beginning of the Olympiads, 746 instead of 747 for the era of Nabonassar, et cetera), and by the Julian period dates in his first column.

The Julian period (not to be confused with the Julian year) is an artificial scale proposed by Joseph J. Scaliger (about 1582) to avoid reckoning B.C. and A.D. dates in two directions. This period (abbreviated J.P.) was often used by older chronologists. It combines solar, lunar, and indiction cycles ($28 \times 19 \times 15 = 7980$ Julian years), beginning with a hypothetical 4713 B.C., when the first year of these several cycles would have coincided. The years J.P. 4713 and J.P. 4714 are exactly equivalent to 1 B.C. and A.D. 1 respectively. (Joseph J. Scaliger, *Opus de Emendatione Temporum,* rev. ed., book 5, pp. 359-361; *cf.* book 6, p. 600; see "Julian Period," in *Haydn's Dictionary of Dates;* also *The American Ephemeris* always gives the Julian period number for the current year, as J.P. 6666 for A.D. 1953.)

Ancient Civil Calendars

IN INTERPRETING ancient time statements we must deal not only with systems of numbering years but also with various calendars. Differing types of calendars are involved in the time statements found in the Bible, and in historical sources bearing on Bible chronology. Several of these calendars will therefore be discussed next.

Calendars Based on Celestial Motions

Since every calendar depends on the movements of the earth, the moon, and the sun, an acquaintance with these movements is indispensable for an understanding of the different ancient and modern calendars.

The day.—A natural unit of which every calendar is composed is the day, a period of 24 hours, determined by a rotation of the earth on its axis. Since the sunrise and the sunset mark two clearly recognizable points of time in that 24-hour period, people have never had any difficulty in designating the day, whether they began it at sunset, as for instance the Babylonians [1] and Israelites [2] did, or at dawn, as was done among the Egyptians.[3] The

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1 Parker and Dubberstein, *op. cit.*, pp. 1, 24.

2 Gen. 1:5, 8, etc.; Lev. 23:32; *cf.* Mark 1:32.

3 Richard A. Parker, *The Calendars of Ancient Egypt*, p. 10. Ptolemy's computations seem to indicate that in his time the day began at sunrise.

beginning of the day at midnight is a comparatively late invention, which was not introduced before Roman times.[4]

The month.—The next larger calendar unit recognizable by an observation of natural phenomena is the month, which approximately coincides with one revolution of the moon around the earth. Since this revolution is accomplished in 29.53059 days, the various months cannot be of equal length as expressed in terms of whole days, which is a natural procedure. Therefore lunar months, as they were used by many ancient peoples, and some modern nations, have an alternating length of 29 and 30 days.

The beginning of the lunar month is difficult to determine by observation, because the moon is ordinarily invisible to the human eye at the time of conjunction, usually called new moon in calendars and almanacs. The moon is at conjunction at the moment when, on her revolution around our globe, she stands between the sun and the earth, so that the half of that celestial body turned toward us receives no light from the sun and lies therefore in complete darkness. Sometimes, when the moon stands exactly between the earth and the sun her shadow strikes the earth, causing in this way a partial or total eclipse of the sun during

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[4] Pliny *Natural History* ii. 79 (Loeb ed., vol. 1, pp. 319, 321); Varro, cited in Aulus Gellius *Attic Nights* iii. 2 (Loeb ed., vol. 1, pp. 239, 241); Plutarch *Moralia*, "The Roman Questions," no. 84 (Loeb ed., vol. 4, pp. 129, 131); Censorinus *De Die Natale* 12 [23] (Maude trans., pp. 36, 37). The statements of these classical authors are correct with regard to the beginning of the day among the Romans, but a word of caution is in place concerning their remarks, mostly erroneous, about the beginning of the day among other peoples.

the short period of conjunction. These are the only times when the conjunction of the moon can actually be observed.

In the Near East it takes 16.5 to 42 hours after conjunction [5]—depending on whether her movements in relation to her distance from the earth are fast or slow—before the moon becomes visible again in the form of a thin crescent, waxing larger and larger until the time of the full moon. The full moon is said to be in opposition, since the sun and the moon stand opposite each other as seen by an observer on this earth. After full moon the visible shape of that body wanes until it becomes invisible from about 42 to 16 hours before the conjunction, by which time one "astronomical lunar month" has been completed.

Since the conjunction of the moon is invisible, the ancients who used a lunar calendar depended either on the first visibility of the new crescent to determine the beginning of each new month, as did the Babylonians, [6] or on the disappearing of the old moon before conjunction, as the Egyptians.[7] The interval between the conjunction of the moon and the evening on which the first crescent can be observed has not yet received a universally recognized term; it will be called in this study the "translation period."

The year.—The largest calendrical unit, the year, is measured by one revolution of the earth around the

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[5] Parker, *The Calendars of Ancient Egypt*, p. 4.
[6] Parker and Dubberstein, *op. cit.*, p. 1.
[7] Parker, *The Calendars of Ancient Egypt*, pp. 9-23.

sun, which averages 365.2422 days, or about $12\frac{1}{3}$ lunar months. This natural solar (or tropical) year, marked off by the recurrence of easily observable seasons, has four cardinal points: the summer and winter solstices, when the sun's apparent path in the sky lies farthest north and south, respectively; and the vernal and autumnal equinoxes, when the sun rises and sets in the exact east and west, with equal day and night over the whole globe. But the solar year is not exactly divisible by lunar months or even by whole days, a circumstance that has given rise to a number of different schemes to harmonize a calendar year, reckoned in whole days, with the astronomical year.

Solar calendar.—Of the several systems of reckoning solar years that have been in use in ancient times, the Egyptian and Julian calendar years were the most important. The ancient Egyptians, using the solar year for chronological purposes, had 12 equal months of 30 days each and, in addition, 5 extra days, which were appended to the end of the 12 months, giving to the whole year 365 days. This calendar, however, was still about $\frac{1}{4}$ of a day shorter than the astronomical year, a whole day every 4 years, or 10 days every 40 years. The ancient Egyptians never took measures to correct this situation; consequently their calendar slipped backward through all the seasons of the year in the course of 1,460 years, as will be explained later.[8]

The Julian calendar (likewise explained later), which was introduced by Julius Caesar, corrected the

[8] See the next section on the Egyptian calendar, pp. 38-45.

deficiency of the Egyptian solar calendar by making every fourth year consist of 366 days, instead of the 365 days of the common year. But even this reform of the calendar was not sufficient, since the year is somewhat short of 365¼ days. In the time of Pope Gregory XIII (A.D. 1572-1585) the Julian calendar had slipped far enough out of line with the seasons to call for a further correction. Today most Western nations use the Gregorian calendar, which is a very slightly modified Julian calendar.[9]

Luni-solar calendar.—Because of their annual festivals, which must come always in the same seasons, the ancient Assyrians, Babylonians, and Hebrews, like most ancient nations that used lunar calendars, had to insert extra months periodically to keep the lunar year in harmony with the solar year, which is about 11 days longer.

The early Assyrians had only 12 lunar months, but they observed that after every 2 or 3 years the end of the 12th month did not quite reach the season in which the New Year's Day should fall. Then they shifted their New Year's Day one lunar month later. In this way the beginning of their year would fall, in the course of time, in every one of their 12 lunar months. In the 12th century B.C. they accepted the principal features of the Babylonian calendar, which followed a slightly different system.[10]

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[9] See pp. 45-47 for the Julian and Gregorian calendars.

[10] Ernst F. Weidner, "Der altassyrische Kalender," *Archiv für Orientforschung*, 5 (1928-29), pp. 184, 185; also his "Aus den Tagen eines assyrischen Schattenkönigs," *Archiv für Orientforschung*, 10 (1935-36), pp. 27-29.

The Babylonian lunar calendar made the same adjustment to the solar year by counting either the 6th or the 12th month twice in every 2d or 3d year; thus the New Year's Day always fell on the first day of the first month, *Nisanu,* and in nearly the same location in the solar year.[11] This calendar was adopted, as already mentioned, by the Assyrians in the 12th century B.C. The Jews had a similar calendar, as will be explained in the next chapter.

After these preliminary explanations, a discussion of the several calendars with which this study is concerned must be undertaken.

The Egyptian Calendar

The Egyptians used several different calendars throughout their ancient history, but for this study only the civil calendar, based on the solar year, is of importance. The Egyptian lunar calendar, used only for festival purposes, can be disregarded here.

The solar year.—It is not quite certain how the Egyptians came to the conclusion that the year consisted of 365 days. O. Neugebauer has recently advanced the theory that they arrived at it gradually as they learned that the annual inundation of the Nile happened at an average interval of 365 days.[12] Since we know that the Egyptians kept careful records of the

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[11] Parker and Dubberstein, *op. cit.*, p. 1.

[12] O. Neugebauer, "Die Bedeutungslosigkeit der Sothisperiode für die älteste ägyptische Chronologie," *Acta orientalia,* 17 (1938), pp. 169-195; also his "The Origin of the Egyptian Calendar," *Journal of Near Eastern Studies* (hereinafter abbreviated to *JNES*), 1 (1942), pp. 396-403.

annual inundations from very early times, it is possible that their 365-day solar year was developed in this way.

Hitherto the most widely accepted theory was that of Eduard Meyer, maintaining that astronomical observations lay at the basis of the Egyptian solar year.[13] From very early times the annual feast of Sothis was celebrated on the day of the heliacal rising of the star Sothis, which we call Sirius, that is, on the day when the star first rises in the eastern sky shortly before sunrise, after a period during which it has been too close to the sun for visibility. The day of this first morning rising of Sirius, which during the dynastic period of Egypt ranged from July 17 to 19,[14] was for many centuries celebrated as a feast day. It has been thought that the observation of Sirius' heliacal rising was the origin of the 365-day solar year.

To this should be added the fact that the first of the three seasons into which the Egyptian year is divided is called *'Akhet,* meaning "inundation." The inundation by the Nile starts in early June in Egypt, and the beginning of the year seems, therefore, to have been at a time of the Sothis feast. When the Egyptians had discovered that the heliacal rising of Sothis occurred approximately every 365 days, harmonizing with the beginning of the Nile inundation, the year of 365 days was a logical development.

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[13] Eduard Meyer, *Aegyptische Chronologie* ("Abhandlungen der Königlichen Preussischen Akademie der Wissenschaften," Phil.-Hist. Klasse, Berlin, 1904, part 1), pp. 1-212; also his *Nachträge zur ägyptischen Chronologie* (*ibid.*, 1907, part 3), pp. 1-46.

[14] Parker, *The Calendars of Ancient Egypt*, p. 7.

After the year had thus been fixed, their conservatism prevented any change, even though they observed that every four years the heliacal rising of Sirius came one day later in their calendar, or, to express it another way, the Egyptian New Year's Day fell one day earlier than the Sothis Day, since a year of 365 days is approximately ¼ of a day shorter than the actual solar year. Thus every four years the failure to add an extra day made all Egyptian dates slip back one day earlier in relation to the seasons, until finally New Year's Day would make the complete circuit of the seasons and again coincide with the heliacal rising of Sothis 1,460 years later.[15]

In a lifetime the seasonal shift was not very great, amounting to only 15 days in 60 years. A keen observer, however, might have been able to tell as an old man that the inundation started 2 weeks earlier now than when he was a child, 60 years before.

The Egyptian year was divided into three seasons of four months each: (1) *'Akhet* "inundation," (2) *Peret,* meaning "emergence" of the fields from the water, and (3) *Shemu* "summer."[16] It is assumed that these names were given to the three sections of the calendar year when they synchronized with the actual seasons as they occurred in Egypt. However, the three calendrical seasons moved back one day every four years with the "wandering" Egyptian year. Thus after 120 years the season which was called "inundation" would precede

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[15] Alan H. Gardiner, *Egyptian Grammar,* pp. 203-205.
[16] *Ibid.*

the actual inundation by the Nile by 30 days, and after 360 years, it would precede it by 3 full months. This apparently did not disturb the Egyptians any more than we are disturbed by our habit of designating October 15, 1952, by the formula 10/15/52, although we know that October means literally the "eighth" month, not the tenth.

The Egyptian calendar has been called a "wandering calendar" because every date, by shifting back one day every four years, "wandered" through all the seasons of the astronomical year in the course of 1,460 years, and this cycle of 1,460 years is called a "Sothic cycle," since New Year's Day returns to the date of the heliacal rising of Sothis, or Sirius, in that number of years.

In the earlier periods of Egyptian history there were no names for the months of the civil year, and the formula "In the 3d month of *Peret*" can be translated as meaning in the 7th month of the year. At the end of the three seasons of four 30-day months each, which totaled 360 days, 5 extra days, the so-called "epagomenae," were added to complete the 365-day year.

From the middle of the second millennium B.C. the months came gradually to be designated no longer by numerals but by names that had been in use in the lunar calendar. In the later period, with which our study is concerned, these month names were used exclusively. Since they are used in the dates of the Aramaic papyri to be studied below, they are therefore listed herewith:

Thoth	30 days	Pharmuthi	30 days
Phaophi	30 "	Pachons	30 "
Athyr	30 "	Payni	30 "
Choiak	30 "	Epiphi	30 "
Tybi	30 "	Mesore	30 "
Mechir	30 "	Epagomenae	5 "
Phamenoth	30 "		
		Total	365 days

The regularity and simplicity of the Egyptian calendar, as one can see from the list given,[17] make it easy to convert an Egyptian date into its equivalent in the Julian calendar for the periods in which the New Year's Day is known. This has been made possible for the 7½ centuries preceding the birth of Christ by the Greek-Egyptian astronomer, Ptolemy, whose work needs some consideration here.

Ptolemy's Canon.—Claudius Ptolemaeus, or Ptolemy, was a noted mathematician, astronomer, and geographer who lived at Alexandria in the second century of our era. He is most famous for his astronomical theory, embodied in a monumental Greek work on astronomy entitled *Mathematike Syntaxis* ("Mathematical Composition"), but better known by the Arabic name *Almagest.* This work, which survives in its entirety, is an embodiment and elaboration of the work of Hipparchus of Rhodes, whose writings are not extant. The Ptolemaic theory, envisioning the earth as a globe around which the heavenly bodies revolve in a com-

[17] Parker, *The Calendars of Ancient Egypt*, p. 8.

plicated system of circles, formed the standard explanation of the universe for 1400 years.[18]

In the *Almagest,* Ptolemy frequently gives observational data to demonstrate his theories of the motions of the moon and other heavenly bodies. In this work he mentions 19 lunar eclipses ranging over 9 centuries, dated to the year, month, day, and hour, mostly in terms of regnal years of various kings.[19] These are extremely valuable for chronology, because they enable the modern astronomer to check on Ptolemy's calculations. Since the intervals between these observations were important to Ptolemy's theory of celestial motions, he gave as a sort of appendix to the *Almagest* a list, or canon, of kings, with the length of each reign, to serve as a chronological scale for his astronomical data.[20]

The first king listed in Ptolemy's Canon is the Babylonian monarch Nabonassar, whose first regnal year began according to Egyptian reckoning on Thoth 1, the Egyptian New Year's Day, on the Julian date that has been established by lunar eclipses as February 26, 747 B.C.[21] This is the starting point of what is called

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[18] Henry Norris Russell, Raymond Smith Dugan, John Quincy Stewart, *Astronomy,* vol. 1, pp. 243, 244; Agnes Mary Clerke, "Astronomy: History of Astronomy," *Encyclopaedia Britannica,* vol. 2 (1945), p. 583.

[19] Ptolemy *Almagest* iv. 6-9, 11, and v. 14, etc. Trans. R. Catesby Taliaferro, in "Great Books of the Western World," vol. 16, pp. 123, 129, 134-137, 140-142, and 172, etc.

[20] The Canon is contained in Appendix A, p. 466, of the above-mentioned volume.

[21] This date can be established because Ptolemy not only dates the eclipses to the hour in his own calendar reckoning but also gives in most cases the number of Egyptian (365-day) years, days, and hours from the starting point of the era. (*Ibid.*, pp. 140-142, 172, for example.)

As to the possibility of confusing any of these eclipses with others occurring on the same date of different years, it is to be noted that a lunar eclipse comes only at full moon. A full moon can occur on the same date in our calendar only

the Nabonassar era. The canon gives the number of regnal years of each king listed—first the Babylonian rulers, followed by the Persians, Alexander the Great and his Ptolemaic successors in Egypt, and finally the Roman emperors, ending with Antoninus Pius. Ptolemy's intention was not to give a complete historical list of reigns, but rather to have a convenient chronological scale to establish the intervals between his various astronomical observations discussed in the *Almagest*. So long as every year in the scale carried a regnal number, it served Ptolemy no useful purpose to list kings who reigned less than a year; hence it is not surprising that these are not included.

Regardless of the various modes of reckoning employed in the countries involved, Ptolemy consistently used his own Egyptian calendar with its 365-day year. Since the starting point of his Nabonassar era on Thoth 1 of the year 747 B.C. (February 26) is established by 19 lunar eclipses, we can locate any year of any of these kings as *reckoned by the Egyptian calendar year,* and can

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every 19 years but can recur in the Egyptian calendar, which shifts backward through the seasons, only about every 25 years. For the recurrence of a phase of the moon in the Julian and Egyptian calendars, see the graphic presentation in Lynn H. Wood, "The Kahun Papyrus and the Date of the Twelfth Dynasty (With a Chart)," *Bulletin of the American Schools of Oriental Research* (hereinafter abbreviated to *BASOR*), no. 99 (October, 1945), pp. 5-9. Besides, not all full moons can be eclipsed; this can take place only about twice a year. Therefore the possibility of a lunar eclipse recurring on the same Egyptian date is reduced still more.

Further, Ptolemy's 19 eclipses, dated by year, day, and even hour, are all in mutual agreement, and various astronomers who have calculated these eclipses by modern methods have all agreed on their dates, varying only slightly as to the hour. Oppolzer's tables of lunar eclipses show that the average variance between his computations and Ptolemy's statements is about ten minutes. (For the lunar eclipses of Ptolemy, see Theodor von Oppolzer, *Syzygien-Tafeln für den Mond,* pp. 31-34; for the astronomical data, see his *Canon der Finsternisse,* pp. 332 ff.)

compute it in B.C. dating. This is an easy process, because the Egyptian New Year's Day drops back one day every four years in the Julian calendar, which is used for B.C. reckoning.

The Julian Calendar

The Julian calendar, named after Julius Caesar, who introduced it into the Roman world, formed the next step in a logical development of the Egyptian solar calendar by adopting its 365-day year and approximately correcting its 1/4-day drift.

The earlier Roman calendar used a lunar year. Since a lunar year is shorter than the natural solar year, it needs to be lengthened periodically, as has been explained, to keep the months in line with the seasons. In Caesar's time the Roman calendar had been allowed to drift more than two months out of alignment because the officials had failed to make the necessary additions from time to time. Finally Julius Caesar took drastic steps to remedy the situation. Correcting the backward displacement by a 445-day year, he introduced, on January 1, 45 B.C., a purely solar calendar, designed by the Egyptian astronomer Sosigenes. This was based on the Egyptian 365-day year, but it provided for the addition of a day every four years, an improvement the Egyptians had never made for themselves. Caesar retained the January 1 New Year's Day (the beginning of the consular term of office); and he kept the older month names as well—even the obsolete September, October, November, and December, which had once

been, as their names indicate, the 7th, 8th, 9th, and 10th months.[22]

When Caesar's successor, Augustus, made Egypt a part of the Roman Empire, he introduced the Julian leap-year scheme into the original Egyptian calendar, pinning down the formerly wandering Thoth 1 to August 29 (August 30 in leap years). During the period of the empire various eastern provinces adjusted their old months to the Roman calendar. The Syriac version of the Julian calendar, for example, still survives in most Arab countries today alongside the uncorrected lunar calendar of the Moslems.[23] It preserves most of the old Semitic lunar month names, beginning therefore with *Teshrin I,* which coincides with our October and has 31 days, and its month *Shubat,* coinciding with our February, has 28 or 29 days.[24]

The Julian calendar was taken over, month names and all, in the western provinces. Consequently it was used in the European world universally until the Gregorian revision of 1582, and in many countries much later than that. In fact, the Gregorian calendar is the same as the Julian, except for the elimination of three leap-year days every four centuries.[25]

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[22] F. E. Adcock, "Caesar's Dictatorship," *CAH,* vol. 9, p. 696; Dio Cassius *Roman History* xliii. 26 (Loeb ed., vol. 4, p. 259); Plutarch, *Julius Caesar,* 59 (Loeb ed., vol. 7, pp. 579, 581).

[23] The Moslem calendar has 12 lunar months, and does not have a system of inserting intercalary months as in the Babylonian and Jewish calendars. Therefore it runs about 11 days short every year, frequently making the circuit of the seasons.

[24] Ginzel, *Handbuch,* vol. 1, pp. 225-228, 263, 264; see also Parker, *The Calendars of Ancient Egypt,* p. 8; G. W. Thatcher, *Arabic Grammar,* p. 218.

[25] When Caesar adopted a 365-day year from Egypt, he eliminated the backward drift of the calendar (see pp. 37, 40) by introducing leap years, of 366 days each, once every 4 years. However, the true solar year is a fraction *less* than

Astronomers employ the Julian reckoning unchanged to this day because of its convenient regularity, and historians date all pre-Christian events in the Julian scale extended backward theoretically, as if it had been in use throughout.

The Babylonian Calendar

The Babylonians celebrated their New Year's Day in the spring, which was the natural thing to do in the Mesopotamian Valley. As soon as the snows melt in the Taurus Mountains, the volume of water in the two rivers, Tigris and Euphrates, increases so much that the canals of the irrigation system in lower Mesopotamia are filled, and cause new life to spring up everywhere.

365¼ days. Hence adding one day *every* 4 years, or 100 in 4 centuries, results in a slight overcorrection, since only 97 leap years in 4 centuries are required to keep the calendar in step with the sun. Consequently, as long as the Julian calendar was in use, the equinoxes and solstices, which mark off the 4 seasons of the true year, completed their circuit a fraction earlier in relation to the calendar year, and thus eventually fell on earlier calendar dates.

This gradual change eventually caused concern because of its effect on the date of Easter, which came later and later in the spring. In the 4th Christian century, when the method of calculating Easter was first settled, the date of spring equinox was March 21. This calendar date had gradually moved forward so much that in 1582 it came 10 days after the equinox, the latter being March 11 in 1582.

Astronomers had long advocated correcting the displaced year. Hence Pope Gregory XIII undertook to restore March 21 as the date of the vernal equinox, and thus also Easter to the place it had held in the 4th century. He decreed that the day following Thursday, Oct. 4, 1582, should not be called Friday, Oct. 5, but Friday, Oct. 15, thus dropping out 10 day numbers from the calendar to correct for the 10 excess leap-year days that had been inserted since the beginning of the 4th century. Further, he ruled that the year should be reckoned uniformly from January 1. (See note 20 in chapter 4.) And to prevent new discrepancies between the calendar year and the astronomical year, he decreed that henceforth those century years that were not divisible by 400 (1700, 1800, 1900, 2100, etc.) were not to be counted as leap years.

This Gregorian calendar was immediately accepted by Catholic countries, but not by Protestant countries until much later. England and the American colonies introduced it only in 1752, by which time the counting of A.D. 1700 as a leap year had increased the error to 11 days. Eastern European countries have adopted it only in the present century. (Peter Archer, *The Christian Calendar and the Gregorian Reform*, pp. 10, 11, 75; John Gerard, "Chronology," *The Catholic Encyclopedia*, vol. 3, pp. 739, 740.)

The vernal equinox may also have had an influence on the establishment of the New Year's Day in the spring, but this is not certain. Whatever may have been the reason, we know that from the earliest time of Babylonian history, New Year's Day was celebrated in late March or April.[26]

The Babylonians did not have a pure solar year, and their so-called luni-solar year consisted of 12 months of unequal length, having either 29 or 30 days each, giving to a 12-month lunar year a total of 354 or 355 days. Since the lunar year was approximately 11 days shorter than the solar year, either the 6th month, called *Ululu*, or the 12th month, called *Addaru*, was repeated every 2d or 3d year. Such a year with its 13 months is called an embolismic, or a leap year, and consists of 383 or 384 days.[27]

Earlier than the fourth century B.C. there was not always a clear sequence in the insertion of embolismic months, but when by observation it was recognized that 19 solar years contain approximately the same number of days as 235 lunar months, a more regular sequence of intercalation was started. In the 4th century, the so-called 19-year cycle, in which the 3d, 6th, 8th, 11th, 14th, 17th, and 19th years were embolismic ones, became a regular feature of the luni-solar year in Mesopotamia. This regularity had already been achieved more or less in the 6th centry B.C., but a number of exceptions show its elasticity prior to the 4th century.[28]

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[26] S. Langdon, *Babylonian Menologies and the Semitic Calendars*, pp. 1 ff.
[27] Parker and Dubberstein, *op. cit.*, p. 1.
[28] *Ibid.*, pp. 2, 5.

In the early history of Babylon there seems to have been no regular system for determining when *Ululu* (the 6th month) or *Addaru* (the 12th month) should be repeated. Later on, when the 19-year cycle became more fixed, the second *Addaru* was inserted six times and the second *Ululu* once (in each 17th year) in each cycle. For this calendar the excellent monograph of R. A. Parker and W. H. Dubberstein, *Babylonian Chronology 626* B.C-A.D. *45,* has complete calendar tables containing all embolismic years as known up to the time of publication, and approximately correct dates for the beginning of every Babylonian month for the time indicated in the title.[29] This work allows us to convert without effort any Babylonian date into its Julian equivalent with a fairly great measure of accuracy.

The Babylonian practice of beginning each month after the first visibility of the new crescent is responsible for the unequal length of the months. Since the beginning of their months was dependent upon the eyesight of the observers and the weather, months were occasionally started a day later than they could have begun if the weather had been more favorable, and if the first crescent had been visible the evening before. Therefore, in one year *Nisanu* or any other month might have 29 days and in another year, 30. The reconstruction of the Babylonian calendar as done most recently, in the work of Parker and Dubberstein, bases its dates for the beginning of the months on an average reasonable

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[29] *Ibid.*, pp. 25-46.

"translation period," but dates that are arrived at in this way may be off by 30 per cent, as the authors admit for their tables.[30] These facts give to the Babylonian calendar always a degree of uncertainty that is absent from the fixed solar calendar of the Egyptians. For all practical purposes, dates expressed in terms of the Babylonian calendar from the 8th century B.C. onward can generally be fixed with a margin of error of only one day. However, it must always be remembered that absolute certainty cannot be achieved in Babylonian dates.

The month names of the Babylonians,[31] which were taken over by the Jews during the exile, are the following (with the Jewish names in parentheses[32]):

1. Nisanu (Nisan)
2. Aiaru (Iyyar)
3. Simanu (Sivan)
4. Duzu (Tammuz)
5. Abu (Ab)
6. Ululu (Elul)
7. Tashritu (Tishri)
8. Arahsamnu (Marcheshvan or Heshvan)
9. Kislimu (Kislev)
10. Tebetu (Tebeth)
11. Shabatu (Shebat)
12. Addaru (Adar)

After having covered the principal ancient calendars that will be encountered in the dates of the documents to be discussed, the next chapter will take up the study of the Hebrew calendar.

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[30] *Ibid.*, p. 23.
[31] *Ibid.*, p. 24.
[32] Six of the 12 Babylonian month names are mentioned in the postexilic books of Zechariah, Esther, Ezra, and Nehemiah, the references being the following: (1) Nisan, Esther 3:7; Neh. 2:1; (3) Sivan, Esther 8:9; (6) Elul, Neh. 6:15; (9) Chisleu (Kislev), Zech. 7:1; Neh. 1:1; (10) Tebeth, Esther 2:16; (12) Adar, Esther 3:7, 13; 8:12; 9:1, 15, 17, 19, 21; Ezra 6:15.

The Pre-Exilic Hebrew Calendar

SINCE THE Jewish calendar of Ezra 7 is a continuation of that used before the Babylonian exile, a study of the Hebrew calendar as it can be reconstructed from the pre-exilic records must precede the discussion of the postexilic calendar system.

In this reconstruction we are on a more insecure foundation than in regard to the calendars of the Egyptians and Babylonians. The reason for this uncertainty is the poverty of source material. In Mesopotamia tens of thousands of cuneiform tablets give all the information necessary to reconstruct the Babylonian calendar so that a comparatively clear knowledge of it can be gained. Our understanding of the Egyptian calendar is equally complete, but for that of the ancient Hebrews the Bible is virtually our only source material before the fifth century B.C. Furthermore, statements bearing on the subject are very few and far between, and in some cases not entirely clear.

The Noachic Calendar

The earliest calendar for which there is some Biblical evidence may have been solar, according to the

records of the Flood (Gen. 7:11, 24, and 8:4). The rain began on the 17th day of the 2d month, and the waters prevailed 150 days, after which time the ark rested upon Mount Ararat on the 17th day of the 7th month. Since there are thus exactly 5 months, totaling 150 days, lying between the 17th of the 2d month and the 17th of the 7th month, the conclusion can be drawn that every month consisted of 30 days; hence there could have been no 29-day months. This observation has led some scholars to believe that Noah's calendar was a solar one consisting of 12 months of 30 days each, with some intercalary days at the end of the 12th month, as in the Egyptian calendar.[1]

Others have thought that the evidence points to a lunar year. Their argument is the following: The Flood began on the 17th day of the 2d month in the 600th year of Noah (Gen. 7:11), and lasted until the 27th day of the 2d month in Noah's 601st year (ch. 8:13, 14), making a total of 1 year and 10 days. Since a lunar year is about 10 days shorter than a solar year, it is thought that the Flood therefore lasted one lunar year and 10 days, the length of one solar year. This latter view—that the entire period of the Flood was one solar year—is thought to be supported by the Septuagint translation of the Old Testament. Its translators, living in Egypt, where they were familiar with the Egyptian solar year, seem to reflect the tradition that the Flood lasted

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[1] For example, see several commentaries on Genesis 7 or 8, as *The Pulpit Commentary* citing Ewald, *The International Critical Commentary*, and Keil and Delitzsch.

for one year, since they give its beginning as the 27th day of the 2d month instead of the 17th day.[2]

Because of the poverty of evidence regarding this early period, it is impossible to say more about the calendar of Noah's time than to make these few remarks. But it should be pointed out that there is not the slightest evidence that either Noah or the Jews at any time had a calendar year of 360 days, which could be the basis of the *prophetic* year of that length.[3]

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[2] This LXX date is one of a number of variations from the Hebrew text. They show a certain consistency and seem to have been based on the assumption that Noah's calendar year was solar. The data according to the LXX are the following:

(1) Beginning of the Flood	27th day,	2d month,	600th year
(2) Ark rests on Mt. Ararat	27th day,	7th month,	" "
(3) Mountaintops visible	1st day,	11th month,	" "
(4) Waters dried up	1st day,	1st month,	601st year
(5) Earth completely dry	27th day,	2d month,	" "

The chief points are these: First, the duration of the Flood, between (1) and (5) is exactly one year. Second, the duration between the beginning of the Flood and its climax (1) and (2) is 150 days (chap. 7:24), and the two months' duration between (3) and (4) is explained in chap. 8:6-12 to have been 40 and 3 times 7 days, a total of 61 days. If, however, the Egyptian solar year was the basis of the dates given by the Alexandrian translators of the Flood record, they should have taken account of the 5 epagomenal days inserted between the 12th and the first months, and their interval between (3) and (4) should have been 65 or (if both dates are included) 66 days instead of 61. This shows, as in so many other cases, that the variant readings of the LXX are by no means superior to those of the Hebrew text.

Several commentaries mention in connection with the Flood story the fact that 12 lunar months plus 10 days are approximately equivalent to a solar year. See, for example, Lange; *The Pulpit Commentary* (both of these citing Knobel); Kalisch; Skinner, in *The International Critical Commentary.* Medieval Jewish scholars differed on this point; Abraham Ibn Ezra says 1 solar year and 10 days, whereas Rashi says 1 lunar year and 10 days, totaling one solar year. See note on Genesis 8:14 in the *Soncino Books of the Bible.*

[3] The 3½ prophetic "times" of Daniel and the Revelation (Dan. 7:25; 12:7; Rev. 12:14) have been regarded from early times as 3½ years, generally reckoned as 360 days each, equivalent to the 1260 days (Rev. 11:3; 12:6) and to the 42 months (Rev. 11:2; 13:5) of 30 days each. Thus derived from prophetic periods, these are quite properly called *prophetic* years and months by many expositors. Some of our early authors, however, unfamiliar with the Jewish lunar calendar, have explained the 360-day year with 30-day months as the Jewish calendar usage. But they are hardly to be blamed, since standard writers on the prophecies had done the same before them.

Many of the leading expositors knew about the Jewish lunar year with its 29-day and 30-day months, or at least did not derive the 360-day prophetic reckoning from a calendar year at all, but from the obvious equivalence of the prophetic pe-

It is possible that the basis for the prophetic year of twelve 30-day months was the same as that of the Babylonian schematic calendar used for business purposes. This 360-day business year existed side by side with the real lunar calendar year with its irregular sequence of 29-and 30-day months. Such a simplified calendar for business purposes proved to be useful for the past as well as for the future, since it eliminated the necessity of keeping exact records of the actual length of each month. The length of the months was ascertainable in regard to the past but not for the future until very late in the development of Babylonian astronomy. Therefore for many centuries contracts for future delivery were made up or rents and interest calculated, regardless of the actual length of that particular year, according to a 360-day business year and to 30-day months.[4] It was used merely as a uniform system of expressing future dates approxi-

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riod of 3½ times with 1260 days (Rev. 12:6, 14) and of the 42 months with 1260 days (Rev. 11:2, 3). But other authors equally well known were misleading. G. S. Faber in 1806 calls the 360-day year "the old computation" (*A Dissertation on the Prophecy . . . of 1260 Years*, vol. 1, p. 4), and the following authorities of the late 18th and early 19th centuries designate either the 30-day month or the 360-day year as Jewish reckoning: Thomas Newton, *Dissertations on the Prophecies*, dissertation 14, p. 192; Edward Bickersteth, *A Practical Guide to the Prophecies*, p. 135; George Croly, *The Apocalypse*, p. 161; William Cuninghame, *A Dissertation on the Seals and Trumpets . . . and the . . . Twelve Hundred and Sixty Years*, p. 115; *Fessenden and Co.'s Encyclopedia of Religious Knowledge*, art. "Month." The last-named work says that the Jews had a 365-day year like the Egyptians, with an intercalary month every 120 years!

The idea of a 365¼-day Jewish year reflects the opinion of earlier authorities, such as Scaliger (1583) and Funck (1570), from an age when knowledge of ancient chronology and calendation was still rudimentary. Ussher (1650) retains this view, but Prideaux (1719) dissents, holding that the Jews exchanged this type of year (which he attributes equally erroneously to the Chaldeans and Persians) for a lunar form with an intercalary month.

The confusion of a prophetic year with a nonexistent Jewish year illustrates the danger of following outmoded authorities.

[4] O. Neugebauer, "The Origin of the Egyptian Calendar," *JNES*, 1 (1942), pp. 400-401.

mately. When the time came for fulfilling the contract, naturally an adjustment was made to the actual lunar calendar date.

Even today theoretical months of 30 days each are used in computing interest, and it is possible that the practical Jews also had such an ideal business year, completely separated from the real calendar year. However, no evidence of the existence of such a year among the Jews has yet come to light, unless the prophetic 360-day year is taken as evidence for the existence of such a year.

Moses' Calendar Reform

The type of calendar in use by the Hebrews in Egypt before the Exodus is not known. It is possible that they used the Egyptian calendar with its wandering year or that they had preserved the Canaanite calendar, which seems to have been lunar, with its beginning in the fall. We know only from Exodus 12:2 that Moses received a divine command to fix the beginning of the year in the month in which the Exodus took place (*cf.* Num. 33:3), which is called *Abib* in chapter 13:4. *Abib* means "the month of ears," because the corn was then in the ear. This month (better known by its postexilic name of Nisan) fell for the most part in late March or April, since the barley harvest did not begin before April in Palestine.

That the year in the Mosaic and post-Mosaic periods was lunar can be deduced from several Biblical statements. The Mosaic laws provided for offerings at the

time of the beginning of the "month" or "new moon,"[5] giving special significance to this day (*cf.* Num. 28:11-14, 10:10). That the day of the new moon was the first day of the month in the time of Saul is evident from 1 Samuel 20:24, 27, where the day after the "new moon," when a royal banquet was held, was called "the second day of the month." So the Hebrew calendar from the time of Moses onward was undoubtedly lunar.

That the Jews must have had a system of intercalation by which the lunar calendar was brought into harmony with the natural solar year is implied in the law regarding the Passover feast. This law required that the feast be kept unchangeably in the middle of the first month (Lev. 23:5), but also connected it with the barley harvest by requiring the offering of a sheaf of the first fruits (Lev. 23:10, 11). Thus the calendar was probably corrected by the insertion of embolismic months whenever needed to let the Passover occur at the beginning of the barley harvest.

The Civil Year

The new ordinance fixing the beginning of the year in the spring implies that the Israelite year had hitherto begun at another time, probably in the fall. While from that time on the "ecclesiastical," or "sacred," year began in the spring, throughout the history of the Hebrew nation the existence of another type of year, called here

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[5] The word *chodesh*, derived from the root *chadash*, meaning "to renew," means in the first place "new moon," then "month." (See the edition of Gesenius' Hebrew dictionary by Brown, Driver, and Briggs.) *Chodesh* has the same meaning in Phoenician as in Hebrew. (See Zellig Harris, *A Grammar of the Phoenician Language*, p. 100.)

"civil year," can be demonstrated from a number of Biblical and extra-Biblical evidences. This is also confirmed by the historian Josephus, who records the Jewish tradition on this point as existing in the first century of the Christian era. After speaking of an ancient reckoning beginning the year in the fall, he continues:

"Moses, however, appointed Nisan, that is to say Xanthicus,[6] as the first month for the festivals, because it was in this month that he brought the Hebrews out of Egypt; he also reckoned this month as the commencement of the year for everything relating to divine worship, but for selling and buying and other ordinary affairs he preserved the ancient order."[7]

This civil fall-to-fall calendar probably synchronized with those in use among the pre-Israelite populations and was taken over either by the patriarchs or by the Jews after the conquest of Canaan.[8]

It has been observed that the Palestinian climate and seasons make an autumnal beginning the natural thing. This is the end of the dry and hot summer, when everything has been dead and barren for several months.

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[6] Xanthicus is one of the Macedonian month names used rather widely in the eastern world during the Greek and Roman periods.

[7] Josephus *Antiquities* 1. 3. 3 (Loeb edition).

[8] That the Hebrew civil calendar corresponded to the Canaanite calendar can first be shown by the fact that both began in the fall (Langdon, *op. cit.*, p. 24), and that two of the four pre-exilic month names mentioned in the Old Testament are attested in Phoenician inscriptions to be Canaanite.

Abib	1st	month (Ex. 13:4; 23:15; 34:18; Deut. 16:1).
Zif	2d	month (1 Kings 6:37).
Ethanim	7th	month (1 Kings 8:2).
Bul	8th	month (1 Kings 6:38).

For references to the Phoenician inscriptions mentioning the months Ethanim and Bul. see Harris, *op. cit.*, pp. 84, 87.

With the beginning of the early rain, new life springs forth, and it is natural to start the year from that point.[9]

A number of Hebrew expressions point to the same direction. The word *tequpha* is used three times as a chronological term in the Old Testament. It means "rotation" and is derived from the verb, *naqoph,* "to make a circle," or "to encircle." In 1 Samuel 1:20 the word denotes the completion of Hannah's pregnancy, and reads literally, "at the rotation of days," which has been translated in the Authorized Version, "when the time was come about," meaning that the regular number of days of her pregnancy had been completed. In Exodus 34:22 and 2 Chronicles 24:23 the word *tequpha* has been correctly translated "at the year's end," and "at the end of the year," since the whole year had made one rotation and the new year was to begin. The parallel passage to Exodus 34:22 is found in chapter 23:16, where the word "end" is the rendering of the Hebrew word *se'th* (infinitive of *yasa'* in the construct state) meaning, "the going forth" or "the emergence." These texts, speaking of feasts that were to be celebrated in the 7th month of the ecclesiastical year, thus clearly state that they came after the end of the year, by which cannot have been meant the ecclesiastical year whose beginning fell in the spring. The texts quoted must therefore refer to the beginning of the civil year.[10]

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[9] Franz M. Th. Böhl, book review of Gustaf Dalman, *Arbeit und Sitte in Palästina*, vols. 1, 2, in *Archiv für Orientforschung*, 8 (1932-1933), p. 245.

[10] The word *tequpha* is explained by Brown, Driver, and Briggs as meaning "at the circuit (completion) of the year." Buhl's 17th edition of Gesenius explains it as "the rotation of the year, i.e. the autumnal or vernal equinoxes." Tregelles' edition of the same dictionary interprets it "after the course of a year," while

Another chronological Hebrew term is the word *teshubah,* meaning literally the "return." In 2 Samuel 11:1; 1 Kings 20:22, 26; 1 Chronicles 20:1 and 2 Chronicles 36:10 this expression is used. In 1 Kings 20:22, 26 it is correctly translated "at the return of the year." The translations given in the other three passages, like the one found in 2 Samuel 11:1 "after the year was expired," are more interpretations than real translations. The margin indicates for these texts that the Hebrew reads "in the return of the year." Although scholars are not unanimous in their interpretation of this word when it refers to the year,[11] the most plausible explanation is to consider it as an expression that indicates a turning point of the year halfway between the beginning and the end. The word *teshubah* is derived from the Hebrew word *shub,* which means "to turn" in the same way as the English noun "return" originates from the verb "to turn." This does not signify the beginning or the end of a certain period or journey, but its turning point. The military campaigns, to which the texts refer, usually began in the spring, as we know from many ancient records. This shows that the spring was considered to be the turning point, lying halfway

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Fuerst's Hebrew dictionary gives it as the "lapse of the year." The commentators have the same explanation, of which Curtis and Madsen's textual note in *The International Critical Commentary,* on 2 Chron. 24:23, may be given as an example, "at the coming round, circuit, i.e. at the completion of the year."

[11] The term *teshubah* is explained by Brown, Driver, and Briggs as "*the return of the year,* i.e. of spring," without saying that it coincided with the end of the year. But several commentators have understood it so. Curtis and Madsen are noncommittal in *The International Critical Commentary,* on 2 Chron. 36:10, but Lange says in his commentary on 1 Chron. 20:1, "When the year was ended, at the time when the kings go out, in the spring, as the most suitable for re-opening of the campaign," and on 1 Kings 20:22 the comment is made that it means "with the beginning of the next year."

between the beginning and the end of the year, which points to the fall as the beginning of the civil year.

Solomon's Civil Calendar

From the time of Solomon we have another evidence for the fall-to-fall civil year. 1 Kings 6:1, 37, 38 states that the work on the Temple of Solomon began in the 2d month of the 4th year of the king and that it was completed in the 8th month of Solomon's 11th year, having been in building for 7 years.

If in the Old Testament, months received numerals, they were always numbered from Abib, or Nisan, regardless of whether the reckoning of the year was from the spring or from the fall. In a year beginning with Ethanim (later Tishri), this 7th month in the ecclesiastical year was therefore *not* numbered as the 1st month of the civil year—although it was the first—but retained its number 7. A civil fall-to-fall year thus began with the 7th month, had the 12th month toward the middle, and ended with the 6th.[12] Hence, if two successive events are dated in the 6th and the 7th months of one and the same regnal year of a king, it means that the year began with the 1st month as among the Babylonians, and that the 7th month followed the 6th in the

[12] It may seem strange at the first glance that the Jews should have labeled the first month of a certain calendar year the "seventh," but a similar practice is being followed today by many business firms that use fiscal years, which in most cases begin with our 7th month on July 1, and end June 30. Also the Jews of the present day are still using a calendar beginning with their 7th month, Tishri, as they have been doing for many centuries. Furthermore, the apparently contradictory custom of labeling the first month "seventh" finds its parallel in a similar procedure that has been followed since Roman times to the present day—that of designating the 9th month of the Julian or the Gregorian calendar by the name "September," which means literally "seventh month," the tenth month "October," which means "eighth month," etc.

same calendar year. If, however, two successive events are dated in the 9th and the 1st months of the same regnal year of a king—as for example in Nehemiah 1 and 2—the calendar is one in which the 1st month is not the beginning of a new year. See the two calendar schemes side by side in Table 1 on page 72.

Intervals beginning with an event are generally reckoned by anniversaries of that event, and not by the calendar year, like the regnal years of the kings.[18] Therefore, the 7 years of Temple building must be reckoned from the date of the beginning of building activities and not from the beginning of a calendar year.

In reckoning time periods the first and the last units of a period were usually included, whether they were complete or not. This method is called "inclusive reckoning." One out of many Biblical examples of the use of this method is found in 2 Chronicles 10:5, 12. Although Rehoboam had asked the people to return "after three days," "all the people came to Rehoboam on the third day, as the king bade." To us such a reckoning would seem to be just as strange as if we should ask a man on Monday to return after three days and see him coming back on Wednesday instead of on Thursday as expected. For the ancient Hebrews "inclusive reckoning" was a commonly used method of

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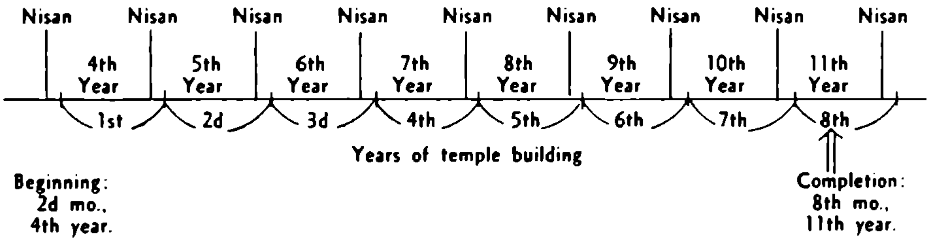
[18] The example of Solomon's Temple building discussed here provides the strongest evidence for the correctness of this statement, since no other known system of computation leads to a harmonious solution of the data as given in the texts quoted. Other evidence for the existence of anniversary reckoning can be seen in the fact that certain feasts were memorial days or anniversaries of remarkable events, like the Passover held each year on the day when the Exodus had taken place (Ex. 13:3-8), or the Purim feast on the two days of the deliverance of the Jews from Haman's sinister plans of destruction (Esther 9:27).

computing time,[14] as also among other ancient peoples.[15]

If Solomon's regnal years began in the spring (with Nisan), and coincided with the ecclesiastical year, then the construction of the Temple would have occupied 8 years instead of 7, as Fig. 2 will show. Only if we assume that his regnal years started in the fall (with Tishri) and that the 2d month in his 4th regnal year fell more than a half year after the civil New Year's Day, can we harmonize the different data given in the texts mentioned.[16]

The anniversary years of Temple building would number eight if Solomon's regnal years began in the spring (Nisan 1):



They would number seven if Solomon's regnal years began in the fall (Tishri 1):

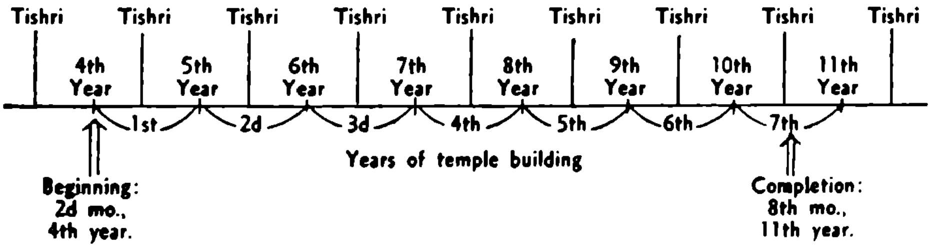


Fig. 2

[14] Other examples of Biblical inclusive reckoning: 2 Kings 18:9, 10; *cf.* Lev. 12:3 with Gen. 17:12; *cf.* Matt. 16:21 (also 17:23; 20:19) with Matt. 26:61; 27:63; and 12:40, in which the same author refers to the same interval as "the third day," "in three days," "after three days," and "three days and three nights" (see also texts in the other Gospels on this crucifixion-resurrection period). On inclusive reckoning see Thiele, *op. cit.*, p. 31.

[15] For Greek and Roman examples, see H. J. Rose, "Calendar: Greek, Roman." *Encyclopaedia Britannica* (1945), vol. 4, pp. 578, 579; see definitions of English derivatives such as *penteteric, octave, tertian fever,* in an unabridged dictionary.

[16] Thiele, *op. cit.*, pp. 30, 31.

The Gezer Calendar

From the same 10th century B.C., in which Solomon reigned, we have archeological evidence of the existence of a fall-to-fall calendar in Palestine. This comes to us in the form of a little limestone plaque found by Macalister during the excavations of the Palestinian city of Gezer.[17] Its text has been explained admirably by W. F. Albright[18] to cover the whole Palestinian calendar, and his translation is given here with a few additional remarks:[19]

"His two months are (olive) harvest;	(Sept.-Nov.)
his two months are grain-planting;	(Nov.-Jan.)
his two months are late planting;	(Jan.-March)
his month is hoeing up of flax;	(March-April)
his month is barley harvest;	(April-May)
his month is (wheat) harvest and festivity;	(May-June)
his two months are vine-tending;	(June-Aug.)
his month is summer-fruit."	(Aug.-Sept.)

The Calendar of the Kingdom of Judah

The civil fall-to-fall calendar remained in use in the kingdom of Judah after Solomon's time throughout the 3½ centuries of its existence. This is shown by a careful analysis of all chronological data dealing with

[17] The latest and most thorough examination of the problems connected with the Gezer calendar was made by Albright, "The Gezer Calendar," *BASOR*, 92 (December, 1943), pp. 16-26.

[18] Albright follows scholars like Vincent, Macalister, Dalman, and others. (*Ibid.*, p. 24.)

[19] Albright gives the translation on pp. 22, 23, with remarks as to which months are meant in notes 30, 32, 37, 38.

this period. The regnal years and the synchronisms contained in the books of Kings and Chronicles can be brought into a harmonious whole only by taking a fall-to-fall calendar as the basis of all civil reckoning in the kingdom of Judah.[20]

The existence of such a calendar during the time of King Josiah can be demonstrated without going into a lengthy discussion. 2 Kings 22:3 records that this king had repair work begun on the Temple in his 18th regnal year. We find, then, that his command was carried out, and funds were delivered to the workmen who did the repair job. During these activities the law book was found in the Temple. After it had been read before the king, and later in the presence of the elders, measures were taken to carry out the instructions found in that book. Josiah had all idolatrous places destroyed, first in Jerusalem and its surroundings, then in the remainder of his kingdom, from Geba to Beersheba, and finally extended his reformatory activities to the neighboring Assyrian province of Samaria. Having done all these things mentioned here briefly, the Passover was celebrated in his 18th year, (2 Kings 23:23). The Passover was celebrated on the 14th day of the spring month (Lev. 23:5) later called Nisan, which was the first month of the

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[20] Thiele, *op. cit.*, pp. 32, 33. It might be mentioned here that a spring-to-spring civil calendar was apparently introduced in the kingdom of Israel by Jeroboam I when the ten tribes broke away from Judah. By assuming the existence of a calendar in Israel which differed from that of Judah, harmony can be reached between the various data provided in the books of Kings and Chronicles. (See Thiele, *op. cit.*, p. 33.) The practice of the northern kingdom, however, has no bearing on the main subject under discussion, the postexilic chronology of the Jews, who continued the practice of the southern kingdom of Judah. Therefore the mere acknowledgment of the existence of a variant calendar in Israel suffices.

ecclesiastical year. If Josiah had begun to reckon his 18th regnal year from Nisan, there would have been only two weeks between the beginning of the Temple repair and the celebration of the Passover to carry out all the different activities described in 2 Kings 22 and 23. Since everyone can see that it was absolutely impossible to do this in such a short time, it has to be assumed that his 18th regnal year began earlier than the 1st of Nisan, hence with the 1st of Tishri. This gave him more than 6 months' time to accomplish the different acts referred to before. That the statements found in 2 Kings 22 and 23 imply the existence of a fall-to-fall civil year has been recognized by scholars for a long time.[21]

The study of the pre-exilic records shows thus that aside from a possible solar calendar in Noah's time, the Hebrew calendar was lunar. It is also evident that Moses' introduction of a religious year beginning in the spring did not abolish an existing civil year which began in the fall, and that the regnal years of the kings of Judah were reckoned according to the civil fall-to-fall calendar, from the time of Solomon to the end of the kingdom of Judah.

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[21] Thiele, *op. cit.*, p. 32. This Passover is cited as evidence for a pre-exilic Hebrew year beginning in the fall by Julius Wellhausen, *Prolegomena to the History of Israel*, trans. J. S. Black and Allan Menzies, vol. 1, p. 108. Many other scholars argue for a pre-exilic fall year; see W. O. E. Oesterley and Theodore H. Robinson, *A History of Israel*, vol. 2, p. 20; Adolphe Lods, *Israel From Its Beginnings to the Middle of the Eighth Century*, trans. S. H. Hooke, p. 436.

The Postexilic Jewish Calendar

THE KINGDOM of Judah ceased with the destruction of Jerusalem and the exile. Many time-honored institutions, like the fall-to-fall calendar, may temporarily have been given up, and it is conceivable, therefore, although not certain, that the Jews living in Mesopotamia adopted the Babylonian calendar. It is certain, however, that they adopted the Babylonian month names which from that time on were exclusively used in the Biblical and extra-Biblical Jewish literature.

After the Jews' return from exile it may have taken some time before innovations, like the adoption of the Babylonian calendar, were dropped once more in favor of old, venerated customs. It should therefore not be surprising to find some evidence for the existence of the Babylonian calendar either during or immediately after the Exile.

Ezekiel's Calendar

The chronological data presented in the book of Ezekiel are not sufficiently clear to arrive at final conclusions as to the type of calendar the exiled prophet

used in Babylonia. His exilic era beginning with the captivity of Jehoiachin (Eze. 1:2) may have been reckoned by either (*a*) a spring-to-spring calendar, (*b*) one that counted the years by anniversaries from the day when the king had surrendered, in the early summer of 597 B.C., or (*c*) a fall-to-fall calendar that began after the captives had arrived in Babylon in the fall of 597 B.C. Each one of the three systems would satisfy the different data given in this book in their relationship with those of Jeremiah and 2 Kings, as a careful study shows.[1]

The Calendar of Haggai and Zechariah

The prophet Haggai, giving his messages in the time of Zerubbabel, a few years after the completion of the Exile, is generally believed to have used the Babylonian spring-to-spring calendar. This has been deduced from the fact that in the records of Haggai the 6th month of the 2d year of Darius (chap. 1:1, 15) precedes

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[1] The test case is Ezekiel 24:1, 2, in which the statement is made that Ezekiel had a vision on the very day when Jerusalem's siege began. The date given is the 10th day of the 10th month of the 9th year, by which the year of Jehoiachin's captivity must be meant according to Ezekiel 1:2 and 40:1. Through synchronisms between Biblical and Babylonian data—some of them astronomical—it can be shown that Jehoiakim's reign ended in the year 598/7 B.C. Jehoiachin, his son, was taken captive after a reign of only 3 months (2 Kings 24:8, 14-16). He was taken to Babylon by Nebuchadnezzar, who had begun his campaign at "the return of the year," i.e. in the spring (2 Chron. 36:10) of 597 B.C.; hence it is probable that Jehoiachin's captivity began either in the late spring or in the early summer. If Ezekiel began to count the years of his captivity in the spring, his date for the foregoing vision would fall on the same day as the date given in 2 Kings 25:1 and Jeremiah 52:4 for the actual beginning of Jerusalem's siege. The same synchronism would result if the prophet dated the vision according to anniversary years, beginning the era of his captivity at some time between the spring and fall of 597 B.C., or if he began to reckon the years of the captivity after their arrival in the fall of 597 B.C. Only if the beginning of his era is extended back to the previous fall, when Jehoiakim was still on the throne, will a disagreement result between Ezekiel 24:1, 2 and 2 Kings 25:1.

the 7th and 9th months in the same 2d year of Darius (chap. 2:1, 10).[3]

For the type of Hebrew calendar used by Zechariah, Haggai's contemporary, the evidence contained in his book is not conclusive. Except for one date in Darius I's 4th year (chap. 7:1), only two dates are given for events that occurred in the same calendar year. Both months mentioned in these two dates—the 8th and the 11th months of Darius I's 2d year—fell between Tishri and Nisan (chap. 1:1, 7), so that it is not certain whether Zechariah used a calendar year beginning in the fall or in the spring. However, since he and Haggai worked together (Ezra 5:1), it is generally assumed that they followed one and the same calendar.

The Calendar of Esther

The chronological data of the book of Esther are not precise enough to reveal the nature of the Hebrew

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[3] The basis of this deduction is as follows: Haggai's first appeal to the leaders was made on the first day of the 6th month of Darius' 2d year (Haggai 1:1). The reason for the calamities that had struck the Jews was declared to have been their unwillingness to build the Temple while building their own homes. To the first speech was added an appeal to go to the mountains and get the necessary wood—needed for scaffoldings and similar purposes—since Judean wood is not suitable building lumber. Good building wood from Lebanon was already present from former procurements. (See Ezra 3:7.) On the 24th day of the same month the decision was taken to follow the prophet's appeal (v. 15).

Haggai's second speech was given on the 20th day of the 7th month of the same 2d year of Darius (chap. 2:1 ff.), which was one of the last days of the Feast of Tabernacles, when many people were gathered in Jerusalem. The prophet had no longer any reproaches or reproofs, but words of encouragement and beautiful promises about the great glory that should come to this second Temple. After all the preliminary work was done, a new foundation stone was laid two months later, on the 24th of the 9th month, (vs. 10, 18), and Haggai gave two speeches on that day. Commentators seem to have unanimously accepted the sequence of Haggai's activities as outlined here, up to chapter 2:9, which includes the prophet's first and second speeches. For the date of the 3d and 4th addresses various explanations have been given, which are unimportant for this study, since they do not affect the generally accepted assumption that Haggai worked with a spring-to-spring calendar.

calendar, but leave the impression that the records given had the Babylonian-Persian spring-to-spring calendar as their basis.[3] This is not astonishing, since the dates given deal with official Persian affairs.

The Calendar of Ezra and Nehemiah

Clear evidence for the Jewish calendar is found once more in the memoirs of Nehemiah. Recording in chapter 1:1 that he had received the bad news about the conditions in Jerusalem "in the month Chisleu, in the twentieth year," and then had spent "days" in weeping, fasting, and praying (v. 4), Nehemiah presented his petition to the king to be sent personally to Jerusalem as governor "in the month Nisan, in the twentieth year of Artaxerxes the king" (chap. 2:1). This shows clearly that for Nehemiah, Kislev (the 9th month) preceded Nisan (the 1st month) in the 20th regnal year of king Artaxerxes. Many scholars have taken this as sufficient evidence for the existence of a fall-to-fall calendar,[4] but

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[3] Esther 3:7, speaking of Haman as casting the lot to find out which date would be the most suitable for destroying the Jews, started with "the first month, that is, the month Nisan, in the twelfth year of king Ahasuerus, . . . from month to month, to the twelfth month, that is, the month Adar." This text recording the activity of a Persian official naturally refers to a spring-to-spring calendar, as the Persians had it. When Mordecai's counteredict went out "in the third month, that is, the month Sivan" (Esther 8:9), allowing the Jews to defend themselves when the attack would come in "the twelfth month, which is the month Adar" (v. 12), probably the same year and calendar system, namely the Persian, is meant, although this is not stated. Since Mordecai was in Persian employ and the edict went out as an official document, it could have contained nothing but dates reckoned according to the Persian calendar. Hence the data of the book of Esther provide no evidence for the nature of the Jewish calendar used at that time.

[4] See Keil on these verses, also Judah Slotki in the *Soncino Books of the Bible: Ezra, Nehemiah, and Esther*. Others, as Adeney in *The Expositor's Bible* and Rawlinson in the *Commentary . . . by Bishops and Other Clergy*, note that a spring year cannot be meant, although they assume an "Asiatic" fall year or an anniversary reckoning of the reign.

others have thought that a scribal error is involved.[5] If the Jews had only a spring-to-spring year as some scholars maintain, it would indeed be strange that they copied the Nehemiah passages without ever changing them or even noticing that errors were made. It would indeed be inexplicable that they would not have wondered why Nehemiah in the first two chapters placed Kislev before Nisan in the same regnal year of a Persian king, if they began their year with Nisan, and everyone knew that Nisan was the 1st month.

The translators of the LXX, who corrected the Bible texts in many places in their translation where they thought that the text contained inconsistencies or needed corrections, translated this text exactly as it is in Hebrew, and it has been transmitted to us without change in the Hebrew as well as in the Greek texts.

These observations make it unavoidable to conclude that in the time of Nehemiah the Jews had returned to their ancient fall-to-fall civil year as it had existed before the Exile for so many centuries. Nehemiah arrived in Judah when the nationalistic sentiments of the Jews ran high. After the humiliating experience of the Exile, the little nation had experienced a rebirth, had rebuilt its Temple, restored its religious services, and had received the right to re-establish its judiciary system under Ezra. This remarkable re-establishment

[5] Rudolf Kittel (*Geschichte des Volkes Israel,* vol. 3, p. 616) thinks that the words "in the twentieth year" of Neh. 1:1 were mistakenly taken over from chapter 2:1. Gustave Hölscher (in *Die Heilige Schrift des Alten Testaments,* ed. by E. Kautzsch, vol. 2, p. 525) considers these words either as a gloss or as an evidence of an anniversary reckoning of Artaxerxes' regnal years.

of the Jews had caused a strong consciousness of national values, so that things foreign had been abandoned, like foreign languages, and probably also the Babylonian calendar, although Babylonian month names had become so much rooted that they were retained.

In the Hebrew Bible the books of Ezra and Nehemiah were regarded as one volume until A.D. 1448, in which year the presently known division was first introduced in a Hebrew manuscript. In the Greek translations the division is found since the time of Origen (3d century), and in the Latin translations since Jerome's Vulgate (5th century).[6] The book Ezra-Nehemiah therefore seems to have had a common editor, who had collected the records of the time of Zerubbabel and combined them with the memoirs of Ezra and Nehemiah, making thus one book. This leads to the conclusion that if in the section of the book that contains Nehemiah's memoirs a fall-to-fall year can be shown to have existed, the same calendar would naturally apply to the section dealing with Nehemiah's contemporary, Ezra.

Summary of the Biblical Evidence

The study of the pre-exilic and postexilic records as discussed in the preceding chapter and this one shows thus that from the time of Solomon an almost consistently used civil fall-to-fall calendar can be recognized, although the records the Bible provides are meager in

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[6] Robert H. Pfeiffer, *Introduction to the Old Testament*, p. 813; Slotki, *op. cit.*, Introduction to Ezra, p. 107.

Religious Year (beginning in spring)		Beginning of Jewish months according to Julian Calendar	Civil Year (beginning in fall)	
Number of the month	Name of the month		Number of the month	Name of the month
1	Nisan	March/April		
2	Iyyar	April/May		
3	Sivan	May/June		
4	Tammuz	June/July		
5	Ab	July/Aug.		
6	Elul	Aug./Sept.		
7	Tishri	Sept./Oct.	7	Tishri
8	Marcheshvan	Oct./Nov.	8	Marcheshvan
9	Kislev	Nov./Dec.	9	Kislev
10	Tebeth	Dec./Jan.	10	Tebeth
11	Shebat	Jan./Feb.	11	Shebat
12	Adar*	Feb./March	12	Adar*
		March/April	1	Nisan
		April/May	2	Iyyar
		May/June	3	Sivan
		June/July	4	Tammuz
		July/Aug.	5	Ab
		Aug./Sept.	6	Elul

* **In leap years an Adar II (Hebrew Ve-adar) was inserted between Adar and Nisan.**[7]

Table 1

this respect. This calendar can be demonstrated to have been in existence in the time of Solomon, during the time of the kingdom of Judah, with clear evidence from

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[7] Since the Mosaic regulations required the offering of a sheaf of barley one day after the Passover sabbath (Lev. 23:10-15), that festival must come at the time of the barley harvest, which in Palestine generally occurs in April. This was accomplished by the insertion of an extra month after the end of the ecclesiastical year—a second Adar between the months Adar and Nisan. Otherwise the Passover feast, which was celebrated in the middle of the month Nisan, would have come too early without such an extra month every two or three years.

Some scholars think that the ancient postexilic Jews intercalated in the same way as the Babylonians did (see pp. 47-50), namely by inserting sometimes a second Elul and at other times a second Adar. (Martin Sprengling, "Chronological Notes from the Aramaic Papyri," *AJSL*, 27, 1911, pp. 233-266.) Jewish scholars, however, have maintained that the second Elul was never used by the Jews, since the insertion of an extra month between the 6th (Elul) and the 7th month (Tishri) would have lengthened the interval between the great Jewish feasts which fell in the 1st and the 7th months of the ecclesiastical year. (D. Sidersky, "Le calendrier sémitique des papyri araméens d'Assouan," *Journal Asiatique*, series 10, vol. 16, 1910, pp. 587-592.)

Josiah's reign, and after the Exile in Nehemiah's time. The evidence from some Biblical books is ambiguous, whereas that of Haggai has generally been interpreted as showing that he used the Babylonian spring-to-spring calendar, which had probably been adopted during the Exile, and apparently not replaced by the old and venerated fall-to-fall national calender until some years later.

It may be of some advantage to give the list of the Hebrew month names as they were in use after the Exile, and the approximate time of their beginning in terms of the Julian calendar. It is not superfluous to stress once more the fact that the month names for the civil as well as for the religious year were the same, and that their numbers were retained in both systems of year dating as Table 1 shows.

Extra-Biblical Evidence for the Jewish Reckoning

That the 5th century Jews actually counted the regnal years of Persian kings according to their own fall-to-fall calendar is attested not only by Nehemiah, and later on traditionally by the Talmud,[8] but also by some archeological evidence from the well-known Aramaic papyri from Elephantine.

Elephantine is a Nile island of Upper Egypt situated near the Nubian border at Assuan, the ancient Syene. During the latter part of the 19th and the early part of

[8] According to the explanation of Rosh Hashanah 1. 1 given by the Rabbis, the 1st of Tishri is the New Year for foreign kings. See *The Mishnah*, "Rosh Hashanah," 1. 1 (trans. H. Danby, p. 188). See also the Gemara on Rosh Hashanah 1. 1 in *The Babylonian Talmud*, "Rosh Hashanah," pp. 3a, 3b, 8a (trans. Isidore Epstein, pp. 7, 30).

the present century, papyrus scrolls were discovered on that island, some of which have only very recently become known.

The first group of papyri was bought from natives some 50 years ago and published in 1906.[9] Many more such documents were discovered in a systematic excavation (1906-1908) carried out on behalf of the Berlin Museum.[10] They were published in 1911.[11] Recently another group of papyri from the same place came to light among the personal effects of Mr. Charles Edwin Wilbour in the Brooklyn Museum. They had been bought at Elephantine in 1893 but had remained in one of Mr. Wilbour's trunks for half a century before they were rediscovered.[12] They are of the utmost importance, since they more than double the number of dated papyri hitherto available for a reconstruction of the Jewish calendar.

All these documents, dated, and undated, now totaling more than one hundred in number, are written in Aramaic, the lingua franca of the Persian empire.[13] They originate from a Jewish colony on the island of Elephan-

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[9] A. H. Sayce and A. E. Cowley, *Aramaic Papyri Discovered at Assuan.*

[10] W. Honroth, O. Rubensohn, and F. Zucker, "Bericht über die Ausgrabungen auf Elephantine in den Jahren 1906-1908," *Zeitschrift für ägyptische Sprache,* 46 (1909-1910), pp. 14-61.

[11] Eduard Sachau, *Aramäische Papyrus und Ostraka aus einer jüdischen Militär-Kolonie zu Elephantine.*

[12] Emil G. Kraeling, "New Light on the Elephantine Colony," *The Biblical Archaeologist,* 15 (1952), pp. 54-56, 58-60.

All Elephantine papyri known up to 1923 were published by A. E. Cowley, *Aramaic Papyri of the Fifth Century B.C.* Quotations of these papyri will be taken from this work unless otherwise indicated, and the abbreviation *AP 1, 2,* etc., will be used. The recently discovered group in the Brooklyn Museum is now edited by Emil G. Kraeling for publication by the Museum in 1953 under the title *The Brooklyn Museum Aramaic Papyri* (2 vols.). These new papyri will be referred to in the present work as *Kraeling 1, 2,* etc.

[13] Raymond A. Bowman, "Arameans, Aramaic, and the Bible," *JNES,* 7 (1948), p. 90.

tine. The dated documents are from the 5th century B.C., and from internal evidence it can be gathered that the undated papyri also date from the same period.[14]

These documents reveal that the Jews of Elephantine formed a garrison in this fortress of Egypt's southern border, and that they had been there for some time when Cambyses conquered the country and made it a Persian possession.[15] The papyri are also very instructive in revealing the type of polytheistic religion practiced by these Jews in Egypt, which was very similar to that found by Jeremiah when he arrived there after Jerusalem's destruction in the early 6th century B.C.[16] As contemporary source material of the time of Ezra and Nehemiah, these documents are thus of the utmost value in informing us concerning the economic, religious, and secular history of the 5th century Jewish colony in southern Egypt.

Moreover they form exceedingly important source material for the study of the calendar in use among the Jews of Elephantine during this century. Since all dated papyri are treated in the Appendix, a summary of the important points is sufficient here.

Papyri bearing one date.—Four of the dated papyri (*AP 17, 26, 30, 31*) contain only one date each, expressed in Babylonian month names. Both the Persians and the Jews after the Exile used the Babylonian month names, but since these four documents are either addressed to or

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[14] Cowley, *op. cit.*, p. xiv.

[15] Kraeling, "New Light on the Elephantine Colony," *op. cit.*, p. 54; Cowley, *op. cit.*, p. xvi.

[16] Cowley, *op. cit.*, pp. xviii, xix; *cf.* Jer. 44.

issued by Persian officials, the assumption seems to be warranted that all dates are Persian, and that the Persian way of reckoning is employed for these four documents.

A number of documents bear only the Egyptian date.[17] The dating of these papyri creates no problems, since Egyptian dates of this period can always be converted into their Julian equivalents with certainty, as has been explained in connection with the Egyptian calendar. Only the uncertain readings in some of the documents, and doubt about the kings referred to in others, make it impossible to reach finality in the dating of all papyri bearing only the Egyptian date.

Papyri dated in two calendars.—Twenty-two of the papyri bear double dates.[18] Since these papyri were written when Egypt was a Persian province, they are dated in terms of the regnal years of the Persian kings, but give the month and day in both the Semitic lunar calendar and the Egyptian solar one. This enables us to convert the Semitic dates into their B.C. equivalents, because the Egyptian New Year's Day for every year of the Persian period is known.[19] The date line is poorly preserved in some of them, and scribal mistakes are involved evidently in some others, which make them unfit witnesses; yet 14 papyri can be used to reconstruct the Jewish calendar in use in Elephantine in the 5th century B.C. The earliest of these typical double-dated

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[17] *AP 1, 2, 7, 22, 29, 35, 43; Kraeling 11, 12, 13.*

[18] *AP 5, 6, 8, 9, 10, 13, 14, 15, 20, 25, 28; Kraeling 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14.*

[19] See footnote 1, p. 118. The dates of these double-dated papyri are discussed in detail in the Appendix.

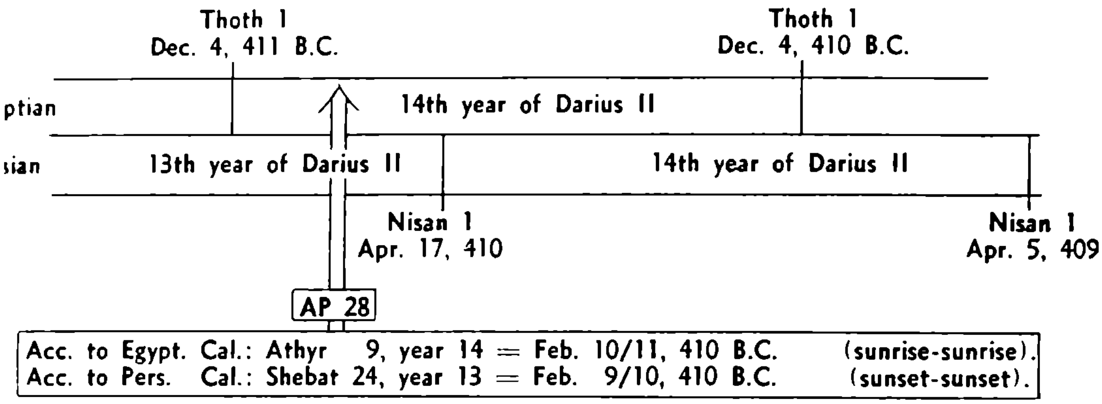

Fig. 3

papyri (*AP 5*) has the following date line: "On the 18th of Elul [in a calendar using Babylonian month names], that is the 28th day of Pachons [in the Egyptian calendar], year 15 of King Xerxes."

Non-Persian reckoning of regnal years.—Two of the afore-mentioned papyri (*AP 25, 28*) show clearly how complicated the dating was during that part of the year when the two calendar years did not coincide. The date line of each carries *two* regnal years. Both of these documents were written in the reign of Darius II, when the Egyptian calendar year began about four months earlier than the Persian. *AP 28,* for example, was a double-dated papyrus written in February, 410 B.C., in the latter part of Darius' year 13 according to the spring-beginning Persian calendar. But in Egypt, with the new calendar year, a new regnal year had already begun on Thoth I in the preceding December. Hence the date formula, expressed in terms of both calendars, gives both regnal years, 13 and 14, for the same date.[20] This will be explained with the help of Fig. 3.

[20] It may seem strange to the modern reader that a single event was dated in two different years, but such a procedure was common even in Colonial America,

The date line of the papyrus reads: "On the 24th of Shebat, year 13, that is the 9th day of Athyr, year 14 of Darius the king." [21] Here the first date, which could equally well belong to either the Persian or the Jewish calendar,[22] contains the Babylonian month name Shebat, and the regnal-year number 13, which is one less than the year number 14 following the Egyptian month Athyr. The 9th of Athyr (the 3d month of the Egyptian civil calendar) fell in the month of February during the greatest part of the 5th century B.C.[23] This was about one month before the beginning of the Persian civil year, which never began earlier than late in March. This papyrus shows that the 14th regnal year of Darius II was reckoned in Egypt 4½ months earlier than in Persia, and during this period, from the Egyptian New Year's Day, Thoth 1 (Dec. 4, 411 B.C.) to the Persian New Year's Day, Nisan 1 (April 16, 410 B.C.), the Egyptians would date an event in the 14th year of the

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before the Gregorian calendar was adopted by England in 1752. At that time the British, with their "Old Style" (Julian) calendar, were of course 11 days out of step with the "New Style" (Gregorian) calendar then in use in the western European countries. (See footnote 25 in Chapter II.) Further, from January 1 through March 24 the year number on British documents was one lower than the Gregorian number, or else appeared in a double form such as 1721/2, etc. This year difference had nothing to do with the 11-day correction, but resulted from the fact that the British had retained a medieval custom of beginning the year on March 25, "Lady Day," nearly 3 months later than the original January 1.

For example, George Washington was born 20 years before the English countries adopted the Gregorian calendar. Thus Washington's birth record in his family Bible reads "ye 11th Day of February 1731/2." (Facsimile, frontispiece in Douglas Southall Freeman, *George Washington*, vol. 1.) It was Feb. 11, Old Style (O.S.), which later became February 22, New Style (N.S.); and the year 1731 was still running by English official reckoning until March 24, although in the countries using the Gregorian calendar the year 1732 had already begun on January 1.

[21] Cowley, *op. cit.*, p. 104.

[22] For proof that the non-Egyptian date is Jewish and not Persian, see pp. 83-87. For the subject discussed here, however, this is of no importance.

[23] Athyr 9 was the 69th day of the Egyptian civil calendar and fell on March 4 in the years 500, 499, and 498. It fell one day earlier during the next 4 years, and continued to do so until it reached February 7 in the year 400.

king, although the Persians still dated the same event to the 13th regnal year.

Evidently the Egyptians under Persian rule were not required to conform to the dating system of their overlords, but in their own legal practices were allowed to use their national calendar. The two papyri mentioned show that they used their solar calendar as well as their own system of reckoning the years of the Persian kings, although this practice resulted in their year numbers being different from those used by the Persians during part of every year.

Further, it seems that the Egyptian date was ordinarily required for legal purposes in Egypt. Since all papyri that contain legal documents bear either the Egyptian date only or two dates, one of which is always the Egyptian one, the conclusion is valid that all legal documents were required to bear the Egyptian date. Furthermore, it can be observed that in the majority of double-dated papyri (18 against 2) which give only one year number, the regnal year number of the Persian king immediately follows the Egyptian month date.

That the year number is really the one according to the Egyptian reckoning, and not according to the Persian reckoning, can be demonstrated in several cases showing that the double dates agree only if the year number is taken to represent the Egyptian way of reckoning the regnal years of Persian kings. For example, papyrus *Kraeling 10* synchronizes the 20th of Adar with the 8th of Choiak in the 3d year of Artaxerxes II. The two mentioned dates coincided on March 9, 402

B.C., which was Choiak 8 in the 3d year of Artaxerxes II according to Egyptian reckoning but Adar 20 in the 2d year of Artaxerxes II according to the Persian reckoning. A year later, when Adar 20 of Artaxerxes II's 3d year according to Persian reckoning fell on March 28, 401 B.C., no synchronism can be achieved, since Choiak 8 was March 8 in that year. This shows clearly that the Egyptian regnal system was usually used in the papyri that record only one figure for the regnal years of the king.

Second regnal year sometimes omitted.—In the papyri *AP 25* and *28* the scribes were careful enough to give the two variant year numbers, as was already explained above. This they should always have done in that portion of the year when a difference between the two calendar systems was involved; but it seems to have been felt that it was not always necessary, since everyone knew that the regnal year number of the king was higher by 1 according to the Egyptian reckoning during that portion of the year that fell between Thoth 1 and the next Persian New Year in the spring or the Jewish New Year in the fall.[24] The difference between two documents, *AP 25* and *AP 10,* shows clearly that the scribe who wrote the first had the habit of giving the regnal year numbers according to two systems, but the other failed to do this. These two papyri, although written in different years, are both dated in the same months—Kislev and Thoth—but only *AP 25* says that

[24] See Fig. 3. This sequence was true at least from Xerxes to Artaxerxes II, and was probably true for other kings for whose reigns we have contemporary data.

Kislev 3 fell in the year 8, and Thoth 12 in the year 9 of Darius II. The other, *AP 10,* simply states that Kislev 7 is Thoth 4 in the 9th year of Artaxerxes I. If it were as specific as *AP 25,* it should read Kislev 7 in year 8 is Thoth 4 in year 9 of Artaxerxes. Thus the absence of the second year number does not mean that the year is the same in both calendars.

Calendar not determined by month names.—Since the Egyptian dating on these papyri seems to be the required legal form, the addition of a lunar-calendar date is evidently optional, allowed for the convenience of the Jewish colonists who were parties to the legal transactions recorded. In that case we should expect those dates to be Jewish rather than Persian. But the fact that Babylonian month names are used is no proof that the calendar involved was Persian, since both the Persians and the postexilic Jews employed the Babylonian month names. The Jewish calendar showed some variations from that of the Babylonians,[25] but these variations are only small, involving usually a difference of only one day, as will be shown in the study of the Elephantine papyri in the Appendix. Furthermore, it seems that the Jews did not adopt the Babylonian method of using the second Elul as an occasional intercalary month. They apparently used only the second Adar preceding Nisan, since a second Elul would have

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[25] No harmony between the double dates can be achieved in many cases, as Parker's study shows, unless the fact is admitted that the Jews after the Exile did not adopt the Babylonian calendar part and parcel. In his discussion of 7 double-dated papyri, agreement to the day was reached in only one case, because the dates of the Babylonian calendar were applied (Parker, "Persian and Egyptian Chronology," *AJSL,* 58 [1941], pp. 288-292).

lengthened the interval between the great Jewish feasts of the 1st and the 7th months in their religious calendar. However, the accuracy of this view, shared by a number of scholars, cannot yet be conclusively proved since only 16 of the 38 embolismic months of the Babylonian calendar in the 5th century B.C. have been attested by actual cuneiform tablets.[20]

Evidence for fall-to-fall calendar.—The evidence for the fact that the Jews in Upper Egypt, like Nehemiah in Palestine, counted the regnal years of Persian kings according to their civil fall-to-fall calendar was found only recently when the Brooklyn Museum papyri became available. Before that time the two already mentioned papyri (*AP 25* and *28*), each of which carries a date line giving two year numbers, were the only proofs that the Jews used two systems of numbering the regnal years of Persian kings. Those papyri did not make it clear whether the non-Egyptian system was the Persian or the Jewish one, because both documents date from a period of the year—the interval between Tishri 1 and Nisan 1—when the regnal numbers according to the Persian and the Jewish systems are the same. Only a regnal numbering that fits one type of year and excludes the other could solve the problem.

The papyrus providing the evidence for the existence of the fall-to-fall calendar among the Elephantine Jews is *Kraeling 6*. This important document, written early in Darius' reign, contains the following date line:

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[20] Parker and Dubberstein, *op. cit.*, pp. 6, 7, 29-32; H. H. Figulla, *Ur Excavations Texts, IV: Business Documents of the New-Babylonian Period*, p. 6.

"On the 8th of Pharmuthi, which is the 8th day of Tammuz, year 3 of Darius, the king." With the exception of one other document (*Kraeling 1*), it is the only one with a date line showing the peculiarity of presenting the Egyptian date first, and then the date using the Babylonian month name, which is followed by the regnal year of king Darius II. All other double-dated papyri have the Egyptian month date in the second place, next to the year number. The unusual procedure found in *Kraeling 6* was apparently the reason that the scribe, instead of giving the commonly used Egyptian regnal year for Darius II, naturally added to the Jewish month and day the regnal year according to the Jewish reckoning, as the following discussion will demonstrate.

Before showing how this papyrus fits into the picture of the Jewish fall-to-fall calendar, we shall, with the help of Figure 4 on page 84, fix the different systems used to count Darius II's regnal years.

The death of Artaxerxes I and the accession of his son, Darius II, to the throne must have occurred in February, 423 B.C., since the last known tablet dated in Artaxerxes I's reign and the first one of Darius II were both written in February, 423 B.C.[27] The accession year of Darius, according to the Persian reckoning, thus lasted to the following New Year's Day, Nisan 1, which fell on April 11, 423 B.C., according to the Babylonian calendar used by the Persians.

In the Egyptian civil calendar, however, a new year had begun on the previous Thoth 1, which fell on Dec.

[27] Parker and Dubberstein, *op. cit.*, pp. 15, 16.

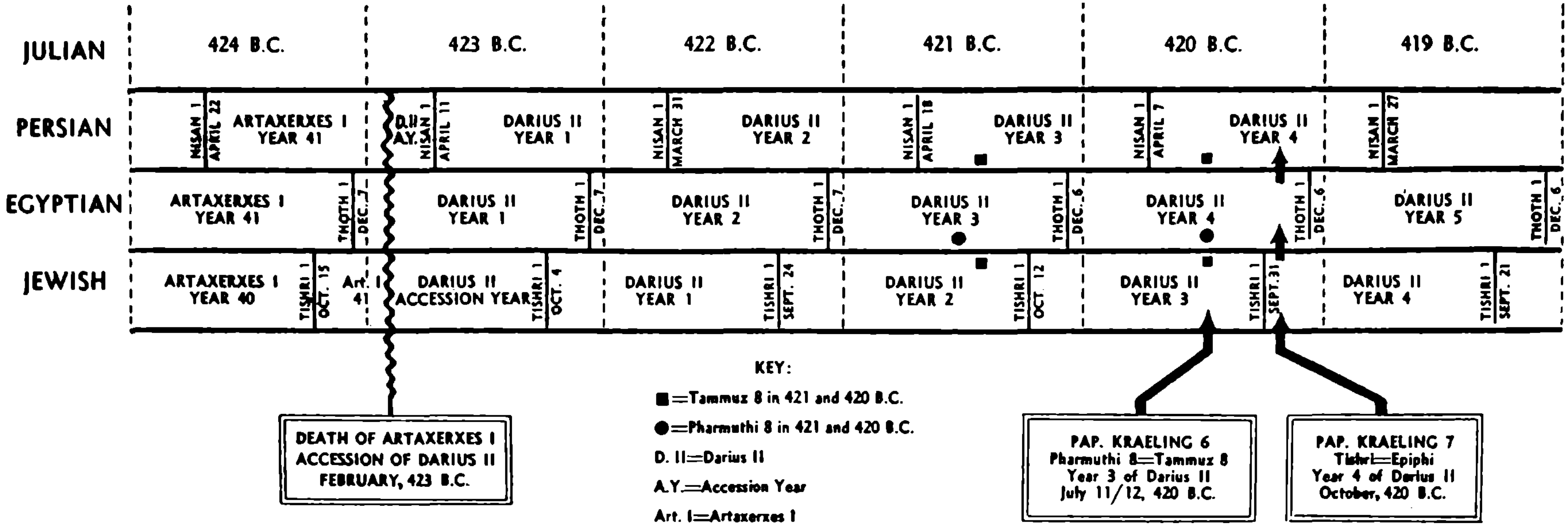

Fig. 4

The Use of the Jewish Fall-to-Fall Calendar Illustrated by Papyrus *Kraeling 6*

The double month dates of *Kraeling 6* coincided only in 420 B.C., and could be dated in the third year of Darius II **only** according to the Jewish fall-to-fall year. No harmony can be achieved in the third year of Darius in either the Egyptian reckoning or the Persian reckoning.

7, 424 B.C. The year beginning on that date is the 325th of the Nabonassar era, marked in Ptolemy's Canon as the 1st year of Darius II. Since the Egyptians could not know the death date of Artaxerxes I before it occurred, they must have dated all documents after Dec. 7, 424 B.C., in the 42d regnal year of Artaxerxes I until they received word about the accession of Darius II, from which day they began to date documents in the 1st year of Darius.[28] If they had called it the accession year instead, then the 1st Egyptian year would have begun in December, 423, 9 months later than the Persian 1st year. However, the double year dating in papyri *AP 25* and *28,* which come from the same reign, prove that the Egyptian year ran earlier than the corresponding Persian year.

If the Jews, however, used a fall-to-fall civil calendar, they counted the accession year of Darius from February, 423 B.C., until their next New Year's Day, Tishri 1, which fell on October 4, 423 B.C. Figure 4 shows graphically the various systems in use under Darius in their relationship to the Julian calendar.

How then does papyrus *Kraeling 6* fit into the picture? It was dated in the 3d year of Darius II, on the 8th day of the Egyptian month Pharmuthi, which in that year was the 8th day of Tammuz (a Persian or Jewish month) that came in midsummer. Figure 4 shows that the 3d year of Darius II in both Persian and Egyptian calendars includes the summer of 421 B.C.,

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[28] The papyrus *AP 6,* to be discussed on pp. 102, 103, provides a similar example of such reckoning, since it mentions the 21st year (the death year) of Xerxes in connection with the accession of Artaxerxes I.

but that by the Jewish reckoning, his year 3 did not begin until the fall of 421, and so included the summer of 420 instead. Thus we can see that if this papyrus was written in the summer of 421, it could have been dated in year 3 according to either the Persian or the Egyptian calendars, but if it was written in 420, its year 3 could be reckoned only according to the Jewish calendar. Therefore we need to determine in which of these two summers Pharmuthi 8 and Tammuz 8 fell on the same day.

In 421 B.C. Pharmuthi 8 was July 11/12 and Tammuz 8 was July 22/23; this year is obviously impossible. But in 420, Pharmuthi fell again on July 11/12 (sunrise to sunrise), whereas Tammuz 8 was July 11/12 (sunset to sunset). Consequently it can be seen that this document must have been written in 420 B.C., and that therefore the scribe *must have been using the Jewish fall-to-fall calendar.*

One more papyrus, *Kraeling 7,* should be mentioned in this connection, since it fits into the picture set forth here. It was written three months after the last-discussed document, "in the month Tishri, that is Epiphi, year 4 of Darius." After the 1st of Tishri, the Jewish New Year's Day, all three systems of reckoning, the Persian, Egyptian, and Jewish, were in harmony for several months, as can be seen from Figure 4. Therefore the year number given in this papyrus was the same 4th year (in Tishri which coincided approximately with Epiphi in 420 B.C.) according to all three aforementioned systems.

This document throws some additional light on papyrus *Kraeling 6* and agrees with the conclusions derived from it. *Kraeling 6,* however, is the important extra-Biblical witness (1) for the existence of a fall-to-fall civil calendar among the Jews in Elephantine in the 5th century B.C., and (2) for the fact that the Jews there counted the regnal years of a Persian king according to this fall-to-fall calendar in the same way as Nehemiah had done a few years earlier (Neh. 1:1; 2:1). Scholars who do not believe in the existence either of such a regnal-year reckoning or of a civil fall-to-fall calendar among the Jews during that time will declare that the scribe of the papyrus *Kraeling 6* made a mistake. Similarly scholars have charged the Nehemiah passages with being erroneous, since these verses do not agree with the theory that the Jews of that time had adopted the Babylonian spring-to-spring calendar. Instead of declaring the Nehemiah passages and this papyrus from Elephantine as mistakes, it is more reasonable to see in them independent evidence supporting each other. Both documents come from the same age—one of them being extant in its original form—and were written by people who belonged to the same religious group. Hence it seems that their strong and united testimony should outweigh the theory of seeing mistakes in their dates.

Conclusion.—The results reached from a study of the Elephantine papyri discussed so far, can be summarized under the following five points:

(1) The Egyptians used no accession year, but

began to reckon the 1st regnal year of Darius II with Thoth 1 preceding the 1st Persian regnal year, which began with Nisan 1. Thus the beginning of each Egyptian regnal year preceeded the Persian one by several months. (*AP 25, 28*).

(2) The Jews in Egypt were not bound to use the Persian calendar in reckoning the years of a Persian king's reign, but employed their own system of reckoning besides the legal Egyptian one (*AP 25, 28*).

(3) The absence of two regnal year numbers in documents coming from that portion of the year when differences existed is no proof that such a difference was not recognized (*AP 10*).

(4) The months following a king's death until the next Jewish New Year's Day were considered as the new king's accession year (*Kraeling 6, AP 25, 28*).

(5) The Jews employed a civil fall-to-fall calendar beginning with Tishri 1 as New Year's Day (*Kraeling 6*).

The Chronology of Ezra 7

The Biblical Artaxerxes

The chronological sequence of Ezra and Nehemiah. —The books of Ezra and Nehemiah, which formed one book in the Hebrew Bible until very recent times,[1] tell the story of the restoration of the Jews, under three successive leaders—Zerubbabel, Ezra, and Nehemiah. The historical accuracy of this sequence was generally accepted among Jews and Christians alike until the end of the last century. However, since 1890 the situation has changed markedly. It was in that year that the Belgian scholar A. Van Hoonacker brought out his first study on the chronological order of Ezra and Nehemiah, in which he argued for a reversing of the traditional order, making Ezra one of the successors of Nehemiah.[2]

This is not the place to discuss the pros and cons of this theory, which a growing number of scholars have accepted during the last 60 years. It should be

[1] See the remarks made on pp. 71, 73 of the present work.

[2] Although the conclusions presented here are not shared by H. H. Rowley ("The Chronological Order of Ezra and Nehemiah," in his *The Servant of the Lord and Other Essays on the Old Testament*, pp. 131-159), his work furnishes an almost exhaustive survey of the history of this problem with a good discussion of the arguments advanced on both sides, and an excellent bibliography of the subject in the footnotes.

stated, however, that the majority of scholars still adhere to the traditional view that Ezra came to Judea 13 years before Nehemiah, and was later associated in Nehemiah's work.[3] This shows that the arguments brought up in favor of a later activity of Ezra have not been strong enough to convince all critical scholars of the soundness of the theory that Ezra arrived in Palestine after Nehemiah, either in the last years of Artaxerxes I or in the 7th year of Artaxerxes II.

That this modern theory has not been universally accepted should be well remembered in view of occasional claims that Van Hoonacker's date for Ezra's arrival "may now be said to be virtually certain,"[4] or that "recent scholarship would put the journey of Ezra to Palestine" in "the seventh year of Artaxerxes II."[5]

The Artaxerxes of Nehemiah.—Doubts as to which Artaxerxes is meant in the book of Nehemiah have almost completely disappeared since the discovery of the Elephantine papyri. The evidence contained in some of these papyri virtually establishes the fact that Nehemiah held his office as governor of Judea under Artaxerxes I.

From the Elephantine papyri *AP 30* and *31* we learn that Johanan was high priest in Jerusalem in 407 B.C.[6] He is mentioned in Nehemiah 12:22, 23 (*cf.* also Ezra 10:6) as the son of the high priest Eliashib, who held his office under Nehemiah (Neh. 3:1).

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[3] *Ibid.*, p. 132.
[4] Albright, *From the Stone Age to Christianity*, p. 248.
[5] Kraeling, "New Light on the Elephantine Colony," *op. cit.*, p. 66.
[6] See Cowley, *op. cit.*, pp. 114, 121.

Josephus, however, claims that Johanan was the grandson of Eliashib.[7] Whether or not he is right is irrelevant to our argument, since we are interested to find that according to both sources, the Bible and Josephus, the high priest Eliashib of Nehemiah's time preceded the high priest Johanan, who held office in 407 B.C. This makes Nehemiah a man of the former generation under King Artaxerxes I.

Additional evidence comes from the mention, in one of these documents, of "Delaiah and Shelemiah, the sons of Sanballat governor of Samaria" (*AP 30,* line 29), showing that Sanballat, the most bitter foe of Nehemiah, was still governor of Judea's neighboring province, Samaria, in 407 B.C. Although the Bible does not tell us that he held the office of governor, it shows clearly that he was a person of influence, and there is nothing in the narrative as told by Nehemiah that is inconsistent with his being governor. It seems, however, that in 407 B.C. he was an old man, and had transferred the administration of the state to his sons, since the Jews in Egypt placed their requests before them. The time when Sanballat decided affairs alone seems to have been a thing of the past, and since the work of Nehemiah clearly lay in the period when Sanballat was actively in charge of the affairs of state in his province, it becomes rather evident that the only Artaxerxes under whom Nehemiah could have held office was Artaxerxes I, who died in 423 B.C.

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[7] Josephus *Antiquities* xi. 7.1 (Loeb ed., vol. 6, p. 457).

For these and some additional less weighty reasons there are few scholars during the last 40 years who have doubted that the Artaxerxes of Nehemiah was Artaxerxes I.[8]

The Artaxerxes of Ezra 7.—The placing of Nehemiah in the time of Artaxerxes I is now quite certain. If we accept the unity of the books of Ezra and Nehemiah, and also the sequence of the story as given in these books, then Artaxerxes I must be considered the one who gave the permission to Ezra for his return to Palestine and the reform of the judicial system, as described in Ezra 7. In that case Ezra came to Palestine in the 7th year of Artaxerxes I (Ezra 7:7-9) and carried out the assignment for which he was sent. Then there is silence in the Bible about his further activities until we find him participating in the dedication of the walls of Jerusalem in the time of Nehemiah, at least 13 years later (Neh. 5:14), as one of the two leaders of the thanksgiving processions marching on top of the completed walls (Neh. 12:36). Again he appears as one of the leading men when the law was read and the covenant made between the people and God under his and Nehemiah's sponsorship (Neh. 8:9).

These considerations make it imperative to accept Artaxerxes I as the king under whom first Ezra and then Nehemiah worked for their nation. Any reversal

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[8] C. C. Torrey, wanting to make Nehemiah a contemporary of Artaxerxes II, is therefore forced to assume the existence of two governors by the name of Sanballat, two generations apart—one, as he has it, in 408 B.C. and another, Nehemiah's enemy, some years later. See his paper "Sanballat 'the Horonite,'" *Journal of Biblical Literature*, 47 (1928), pp. 380-389.

in this sequence does violence to the narrative of the two books as they have been transmitted to us, and has therefore to be rejected. In accepting Artaxerxes I as the king of Ezra 7 we are in good company with the majority of scholars who have so far expressed themselves on the subject.[9]

The Regnal Years of Artaxerxes I

Ezra, like his postexilic predecessors and the later-coming Nehemiah, dated events according to the regnal years of Persian kings under which they lived. Most scholars assume that these dates are reckoned according to the Babylonian calendar, which was employed by the Persians. The first task is therefore to ascertain the regnal years of Artaxerxes I according to Persian reckoning.

It has been shown that the Egyptians, also under Persian rule at that time, numbered the years of their Persian overlords according to the Egyptian calendar; also that our extra-Biblical evidence for the Jewish calendar, and their system of reckoning the regnal years of Persian rulers, is found in a series of documents from Egypt. Several of these bear Jewish and Egyptian dates, and one of them is our earliest date for the reign of Artaxerxes I. Therefore we must also establish the years of Artaxerxes according to the Egyptian reckoning.

Finally the years of Artaxerxes according to Hebrew reckoning must be ascertained.

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[9] Rowley, *op. cit.*, pp. 134-136.

Establishment of Persian regnal years.—The discoveries of the last hundred years made in Mesopotamia and Egypt have produced much material that has put the chronology of the Neo-Babylonian and Persian empires on a solid basis. Thousands of dated tablets, for example, can be fitted into an almost complete series of regnal years. But, as has been explained,[10] a date formula like "on the 1st day of the 5th month in the 16th year of Xerxes" is a relative statement; it means different things in different dating systems, depending on the exact date of accession, the use of the accession-year or non-accession-year system, and the different starting points of the various calendar years. In order to pin down these regnal-year series in absolute chronology, we depend on certain specific documents that furnish additional data of the sort that enable us to locate exact B.C. dates—such information as synchronisms with other dating systems, or astronomical data that can be verified by calculation.

One of these anchor points, from which we can locate other relative dates, is furnished by an astronomical tablet bearing a series of observations dated in the 37th year of Nebuchadnezzar. These fix the year as having begun on April 22/23, 568 B.C., and ended on April 11/12, 567 B.C.[11] Another astronomical tablet of equal importance has established that the 7th year of Cambyses lasted from April 6/7, 523, to March 25/26,

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[10] See pp. 16-23.
[11] Neugebauer and Weidner, *op. cit.*, pp. 66, 67, 72.

522 B.C.[12] With the help of the Canon of Ptolemy[13] and thousands of dated cuneiform documents written on clay tablets, which agree throughout as to the total of regnal years for each king, it is possible to arrive at exact dates for each of the kings reigning in the period between the two astronomical tablets.

For the kings succeeding Cambyses, and especially those of the 5th century, our chronology again depends on Ptolemy's Canon and the Saros Tablets,[14] supported by numerous dated cuneiform documents, to which can be added the double-dated papyri from Elephantine,[15] whose synchronisms between the known Egyptian cal-

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[12] J. N. Strassmaier, *Inschriften von Cambyses, König von Babylon,* no. 400. For the calculation of the dates of the astronomical events, see Franz X. Kugler, *Sternkunde und Sterndienst in Babel,* vol. 1, pp. 61-75. An eclipse mentioned on this tablet (see A. T. Olmstead, *History of the Persian Empire,* p. 202, for a translation of the entry) is recorded also by Ptolemy (*Almagest* v. 14, p. 172). For the time of this eclipse see Oppolzer, *Syzygien-Tafeln,* p. 31, and his *Canon der Finsternisse,* p. 335; also C. F. Lehman and F. K. Ginzel, "Die babylonisch-assyrischen Finsternisse," in Ginzel, *Spezieller Kanon der Sonnen- und Mondfinsternisse,* p. 258. The agreement between the tablet and the *Almagest* on the date of this eclipse shows that Ptolemy's numbering of Cambyses' regnal years harmonizes with the ancient Babylonian practice.

[13] See pp. 42-44 of the present work.

[14] The ancient Babylonians discovered that after 223 lunar months or about 18 years both solar and lunar eclipses repeat themselves almost exactly. Such a cycle of 18 years was called a "saros," a term which has been adopted by modern astronomers and is now used by them in the same sense. Cuneiform tablets written under the Seleucid kings and containing a list of the saros cycles have been found. For the Persian period, these Saros Tablets give, for example, the following years:

9th (year of) Darius [I]	18 (years)
27th (year of) Darius [I]	18 (years)
9th (year of) Xerxes	18 (years)
6th (year of) Artaxerxes [I]	18 (years)
24th (year of) Artaxerxes [I]	18 (years)
1st (year of) Darius [II]	18 (years) and so on.

The lengths of reign of the various kings can thus be easily determined. If, for example, 18 years elapsed between the 27th year of Darius I and the 9th year of Xerxes, Darius' reign must have had a total length of 36 years, and if 18 years lay between the 9th year of Xerxes and the 6th year of Artaxerxes I, Xerxes must have reigned altogether 21 years. Since the regnal years of kings as derived from the Saros Tablets agree in each case with those given in Ptolemy's Canon, one serves as check on the other and supports the data provided by the other. See J. N. Strassmaier, "Einige chronologische Daten aus astronomischen Rechnungen," *Zeitschrift für Assyriologie,* 7 (1892), pp. 197-204; also his "Zur Chronologie der Seleuciden," *ibid.,* 8 (1893), pp. 106-113.

[15] See pp. 73-76, and the more detailed discussion in the Appendix.

endar and lunar month and day furnish contemporary evidence for the regnal years of this period.

For example, one of these papyri, *AP* 5, helps thus to fix the 15th regnal year of Xerxes, in which the papyrus is dated, for the double dates show that it was written between September 12, sunrise, and September 13, sunrise, 471 B.C.[16] Since we know that the Persian calendar year began in the spring, the 15th regnal year of Xerxes must have begun in the spring of 471 B.C. and ended in the spring of 470 B.C. Other double-dated papyri similarly fix the B.C. dating of the 14th, 16th, 19th, 25th, 28th, 31st, and 38th regnal years of Artaxerxes I, also the 13th year of Darius II, and the 1st and 3d years of Artaxerxes II. Since the dates obtained from these papyri are in agreement with those given in Ptolemy's Canon, with which the Saros Tablets harmonize also, no reasonable doubt exists as to the validity of the accepted dates for the Persian kings of the 5th century B.C. as they are given, for instance, in Parker and Dubberstein's *Babylonian Chronology.*

Artaxerxes I's years according to Persian reckoning. —Artaxerxes I was the younger son of Xerxes, who was killed in his 21st regnal year by one of his leading courtiers, Artabanus. Throwing the blame of the murder upon the king's older son, the assassin induced the younger son, Artaxerxes, to have his brother killed and to take the throne, thinking that the latter was a weakling who could easily be dominated. Later, when

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[16] See Appendix p. 125.

he attempted to do away with Artaxerxes also, presumably to ascend the throne himself, the young king slew him and took full control of the government.[17] Some writers of the Christian era, regarding Artabanus as a king with a 7-month reign, have reckoned Artaxerxes' reign as beginning only at Artabanus' death,[18] but the classical Greek historians, who are our sole authorities for the story, refer to Artabanus as a high official, never as king.[19] Artabanus is not known from contemporary records, and the story about his short reign between Xerxes and Artaxerxes, found in some older histories, must be considered a legend.

We must conclude, then, that Artaxerxes' reign is to be reckoned, according to contemporary records, as beginning at the death of his father, Xerxes. The evidence of the double-dated papyri, Ptolemy's Canon, and the Saros Tablets, fix the regnal years of both these rulers, as has been shown in the preceding section. The conclusion is thus reached that the Persian calendar year that began in the spring of 465 and lasted to the spring of 464 began as the 21st regnal year of Xerxes, in which he died, and ended as the accession year of

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[17] Diodorus Siculus xi. 69 (Loeb ed., vol. 4, pp. 305, 307); also Justinus iii. 1. Diodorus seems to put the death of Artabanus immediately after the killing of Xerxes and his older son, but other accounts indicate an interval during which Artabanus held office under Artaxerxes. When Themistocles the Athenian came as an exile to "King Artaxerxes," "who had lately come to the throne" (Thucydides i. 137.4, Loeb ed. vol. 1, p. 233), he received permission to see the king through the high official, Artabanus (Plutarch, *Themistocles* 27, Loeb ed., vol. 2, pp. 73-75).

[18] Eusebius, *Chronica*, under the year 1552 of his Abraham Era. This is probably the source of Sir Isaac Newton's giving 7 months to Artabanus and beginning the reign of Artaxerxes late in 464 B.C. (Isaac Newton, *The Chronology of Ancient Nations Amended*, p. 354.)

[19] It is true that Diodorus has Artaxerxes ascending the throne after killing Artabanus, but even he makes it clear that Artabanus never succeeded in gaining the throne for himself. The other authorities (mentioned in note 17) speak of Artabanus only as a courtier of the king.

Artaxerxes, and that the 1st regnal year of Artaxerxes I followed immediately, beginning with Nisan 1 in the spring of 464 B.C.

As for the exact date of the beginning of Artaxerxes' reign, the cuneiform evidence for the latest regnal date of Xerxes is a tablet which, although not contemporary, mentions an earlier record that necessitates placing this accession late in 465 B.C., evidently in December. Certainly, according to one of the papyri, it took place before Jan. 2, 464 B.C. Since the exact accession date is not necessary to fix the Persian regnal years of Artaxerxes, but is important in determining the Jewish reckoning of the reign, the evidence for this will be discussed in that section.[20]

The source evidence already discussed shows that every document dated in the year 1 of Artaxerxes must have been written between the spring of 464 and the spring of 463 B.C., if the Persian method of reckoning was followed. Hence events dated in the 7th year of Artaxerxes occurred in the interval from the spring of 458 to the spring of 457 B.C., if dated according to the Persian system.

Artaxerxes I's years according to Egyptian reckoning.—During the whole 5th century B.C., Thoth 1, the New Year's Day of the Egyptian wandering year, fell in December,[21] while the lunar Nisan 1, the Persian New

[20] See pp. 100-106.

[21] See pp. 40-42. Thoth 1 fell on Dec. 26 during the years 501, 500, 499, and 498 B.C. During the next four years it fell on Dec. 25, and so on, until in its backward shift it reached Dec. 1 during the years 401, 400, 399, and 398 B.C.

Year's Day, fell in the spring, in either March or April.[22] Since the ancients reckoned regnal years according to whole calendar years, and the Egyptian and Persian calendar years overlapped for only 8 to 9 months every year, there were always 3 to 4 months when the regnal numbering of a Persian king differed in the two calendars.

Wherever the Canon of Ptolemy can be checked by contemporary documents in the Persian period (covering all but the last three rulers),[23] it uniformly begins the Egyptian regnal year of each ruler with the Thoth 1 that *precedes* the corresponding Persian New Year's Day, and never with the Thoth 1 that *follows* it. The discussion of the Aramaic papyri from the 5th century B.C. in the Appendix will show that this system was not an artificial one made up by Ptolemy centuries after the end of the Persian rule but was standard procedure in Egypt—certainly during the 5th century, and probably also during the other centuries covered by Ptolemy's Canon.

This has already been illustrated in the discussion of a double-dated papyrus, *AP 28,* which in its date line carried two regnal years, the 13th and 14th of Darius II. The document was written in February, 410 B.C., when Darius' Egyptian year 14 had already begun in December, but before the Persian year 13

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[22] Parker and Dubberstein, *op. cit.*, pp. 29-32, give March 23 as the earliest date for Nisan 1, during the 5th century B.C., and April 23 as the latest date for Nisan 1. However an April 24 is now attested for Nisan 1 in 408 B.C., since the publication of an embolismic month in 409 (Figulla, *op. cit.*, p. 6) requires shifting Parker and Dubberstein's unattested *Ululu II* back one year.

[23] See Parker and Dubberstein, *op. cit.*, pp. 11-16.

had ended in the spring (or the Jewish year 13 in the following fall).[24]

To state it briefly: If a document, dated according to the Egyptian system of reckoning in a year of a Persian king, is written between the Egyptian Thoth 1 and the Babylonian Nisan 1 in the following spring, it will contain an Egyptian year number that is higher by one than the equivalent Persian year number. After Nisan 1 there is no difference in the regnal number up to the last day of the Egyptian year; then the next Egyptian regnal year of the Persian king would again precede its Persian equivalent by several months.

Thus year 1 of Artaxerxes I ran from Dec. 17, 465, through Dec. 16, 464 B.C. according to the Egyptian system of reckoning regnal years, and therefore his 7th Egyptian year ran from Dec. 16, 459, through Dec. 15, 458 B.C.

Artaxerxes I's years according to Jewish reckoning.—It was pointed out in chapters 3 and 4 that a civil fall-to-fall calendar was in use in the kingdom of Judah up to the time of the Babylonian Exile, and also among the Jews after the restoration. Nehemiah's records show that the regnal years of even a foreign king were reckoned according to the Jewish fall-to-fall calendar, just as the Egyptians numbered the regnal years of Persian kings according to their own calendar year.

Since an event dated by Nehemiah in the month Kislev of the 20th year of king Artaxerxes preceded

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[24] For an explanation and diagram of *AP 28*, see pp. 77, 78. For the dates of this papyrus and the similar *AP 25*, see the Appendix.

another event which took place in Nisan of the same 20th year, Nehemiah obviously dated Artaxerxes I's regnal years according to a calendar in which Kislev preceded Nisan, as it is found in a fall-to-fall calendar beginning with Tishri. In this way the Persian and Jewish calendars coincided for only 6 months, so that for half a year the regnal year number of a king would be higher by one in one of the dating systems.

However, the Biblical evidence is not sufficient to indicate whether Artaxerxes' regnal years according to Jewish fall-to-fall reckoning preceded the corresponding Persian years or followed them. In other words, we need to know whether the 20th year of Artaxerxes according to Jewish reckoning began in the fall, when it was still the king's 19th year according to Persian reckoning, or whether it began in the fall of the 20th Persian year and continued to be considered the 20th year by the Jews for 6 months after the following Nisan 1, when for the Persians the 21st regnal year of the king had started.

This problem can fortunately be solved through two existing extra-Biblical contemporary documents, which show that Xerxes' death occurred toward the end of 465 B.C., evidently in December. Therefore Artaxerxes' years according to the Jewish regnal system ran half a year later than by the Persian calendar. The December date of Xerxes' death is proved by a cuneiform tablet found in the excavation campaign of 1930-31 in Ur, an agreement dealing with the rearrangement of land parcels among four brothers. The agreement is dated in the 13th year of Artaxerxes I, but states that the

original arrangement was signed in the month *Kislimu* of the 21st year of Xerxes.[25]

In Babylonia *Kislimu* began, according to the Parker-Dubberstein tables,[26] on December 17 in 465 B.C., the earliest day on which the document could have been written. On that day the scribe writing the agreement in Ur knew no more than that Xerxes was still alive, or he would have dated the document in the accession year of his successor. This shows that Xerxes' death cannot have been much earlier than December 17, even if it took some days to become known in Ur. We do not know where the murder of Xerxes took place, although the most likely place was either Susa or Persepolis,[27] but in either case the news of the king's death would not have taken long to be known in the Mesopotamian valley.

That Xerxes' death did not occur much later than Dec. 17, 465 B.C., is proved by a document written in Egypt on January 2, 464 B.C., in which the accession of Artaxerxes is already mentioned. This document, *AP 6*, one of the Aramaic papyri that have been mentioned before, bears the following date line: "on the 18th of

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[25] Figulla, *op. cit.*, no. 193, p. 15.

[26] Parker and Dubberstein, *op. cit.*, p. 30.

[27] Babylon probably ceased to be the winter residence of the Persian kings after the rebellion under Xerxes and the destruction of its walls and temples, so that only Susa and the new capital Persepolis remained as major residence cities of the court. Hence the conclusion seems to be warranted that the death of Xerxes occurred in one of these cities. The only other possible place could be Ecbatana, the former Median capital, but this city seems to have lost its importance after Darius I, and is henceforth not mentioned as the residence of a Persian king. On the Babylonian revolt under Xerxes see George G. Cameron, "Darius and Xerxes in Babylonia," *AJSL*, 58 (1941), pp. 319-325. On Ecbatana see the article "Ekbatana," in Pauly-Wissowa's *Real-Encyclopädie der classischen Altertumswissenschaft*, half-vol. 10.

Kislev, which is the [17th] day of Thoth, in year 21, the beginning of the reign when King Artaxerxes sat on his throne."[28] It is certain that this document was written in the accession year of Artaxerxes I, and not Artaxerxes II or III, since only this king came to the throne in the 21st year of his predecessor, Xerxes.[29] Unfortunately the day number of the month Thoth is broken. The remaining signs of that number could be restored to 7, 14, or 17 on paleographic grounds,[30] but only the 17th of Thoth harmonizes with the 18th of Kislev in the death year of Xerxes, which was at the same time the accession year of his son Artaxerxes; so that the restored date "17th day of Thoth" seems to be assured. The 17th of Thoth fell on January 2/3, 464 B.C., sunrise to sunrise. It is thus clear that by January 2, 464 B.C., the news of Artaxerxes' accession had reached Egypt, although so recently that the scribe of *AP 6*, having been in the habit of dating documents in the 21st year of Xerxes for several months, started out to do this and then finished the date line by adding the year of Artaxerxes' accession.

The two documents support each other in a rather conclusive way, and the statement made by the historian Olmstead that Xerxes was assassinated "near the end

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[28] Translated from the Aramaic. See Cowley, *op. cit.*, p. 16 for the Aramaic text.

[29] Artaxerxes I succeeded Xerxes, who reigned 21 years; Artaxerxes II succeeded Darius II, who reigned 19 years; Artaxerxes III succeeded Artaxerxes II, who reigned 46 years. The lengths of these reigns are attested by Ptolemy's Canon and the Saros Tablets; those of Xerxes and Darius II are corroborated by the double-dated Aramaic papyri.

[30] See pp. 125-128 and Plate I.

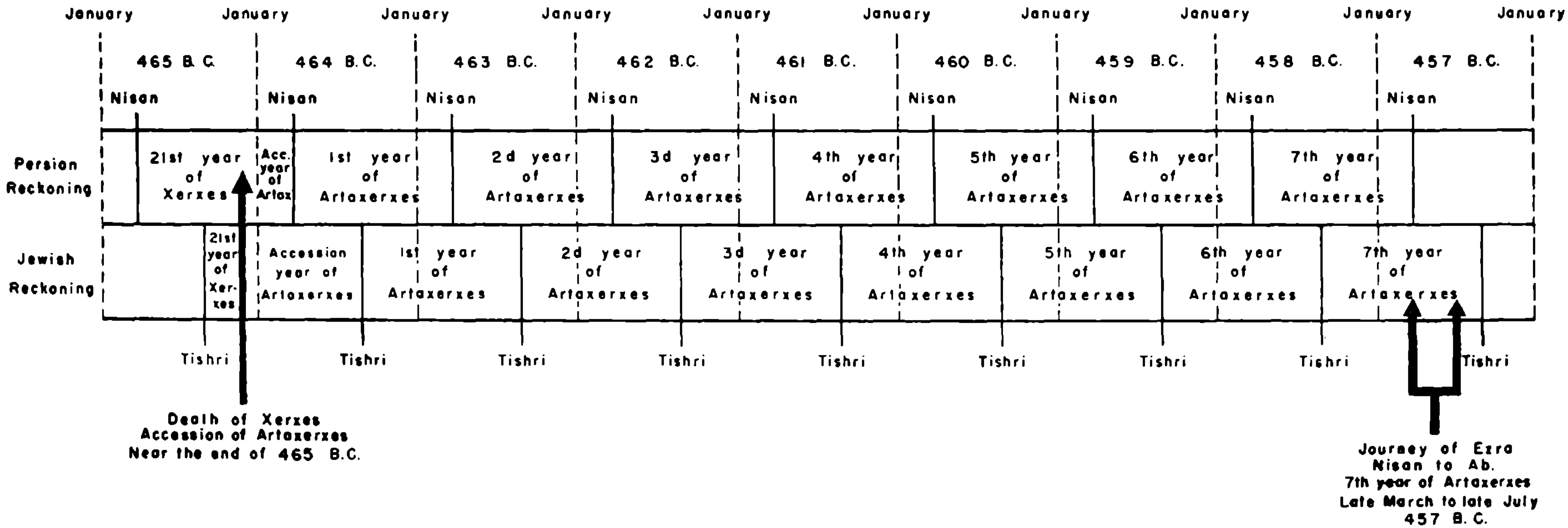

Fig. 5

From the Twenty-first Year of Xerxes to the Seventh Year of Artaxerxes I

This chart shows that the death of Xerxes and the accession of Artaxerxes in December, 465 B.C., caused the first regnal year of Artaxerxes, according to Jewish reckoning, to begin in the fall of 464 B.C. Hence the journey of Ezra in the seventh Jewish year of Artaxerxes occurred entirely in 457 B.C.

of 465" [31] has proved to be correct, although it was based at that time on only one of the two documents mentioned above. Though the actual death date of Xerxes will probably never be known, it is virtually certain that the king's death occurred near the end of the year 465 B.C., because in Mesopotamia, Xerxes was still believed to be alive on December 17, and by January 2 the news of his son's accession had already reached Egypt.

This evidence makes it certain that Jews, like Nehemiah, using a civil fall-to-fall calendar, began to reckon the first regnal year of Artaxerxes on Tishri 1, 464 B.C., and not in 465, since Xerxes was still alive after Tishri 1, 465 B.C., and for about two months after that date. From December, 465, or as soon as the Jews heard of the accession of Artaxerxes to the throne, they would begin to date events in the accession year of Artaxerxes and continue this up to the time of their New Year's Day on Tishri 1, when they would begin to date events in his first year. Figure 5 will make this clear.

Ezra's journey in the seventh year of Artaxerxes.—Consequently, if the 1st year of Artaxerxes I ran from the fall of 464 to the fall of 463 B.C. according to Jewish reckoning, the king's 7th year ran from the fall of 458 to the fall of 457 B.C., as is clearly seen in Figure 5. Then the journey of Ezra, dated in Ezra 7:8, 9 as having begun in Nisan and ended in Ab of the 7th year of

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[31] Olmstead, *History of the Persian Empire*, p. 288.

Artaxerxes, reached from late March to late July, 457 B.C.

The evidence presented in chapter 4, not only from Nehemiah, but also from an Elephantine papyrus proving that the Jews in Egypt reckoned a Persian king's years according to a fall-to-fall year, as well as the establishment in the present chapter of Artaxerxes' accession date in December, 465 B.C., from an Ur Tablet, places the dates given in the preceding paragraph on a sound basis. These documents, taken together with the Biblical statements of Nehemiah and Ezra, lead to the inescapable conclusion that the decree of Artaxerxes I went into effect after Ezra's return from Babylon, in the late summer or early fall of 457 B.C.

Summary of the Findings

THE CAREFUL reader of the preceding chapters will have gained an idea of the vast problems connected with the dating of historical events of antiquity. He has thus become acquainted with different calendars, and with varying methods of counting calendar years or regnal years of kings in use among ancient nations.

The counting of regnal years.—The historical evidence indicates that the different nations had various methods of reckoning the regnal years of their kings by calendar years.[1] The Egyptians used a method in which the death year of one king became also the first one of his successor, called the non-accession-year (or antedating) system. However, the peoples of the Mesopotamian valley used a method called the accession-year (or postdating) system, since they designated the unexpired portion of the death year of one king as his successor's accession year, and began the new king's year 1 only on the following New Year's Day. Under the divided kingdoms of Israel and Judah both systems were used at different times, depending on whether

[1] See pp. 15-24.

Egypt, Assyria, or Babylonia had greater influence on the two small nations in Palestine.

Solar and lunar calendars.—Owing to the fact that a solar year is divisible neither by full lunar months nor by whole days, different systems of reckoning years were used.

The Egyptians employed a solar year of 365 days.[2] Since this was about one-quarter of a day short of a true solar year, their New Year's Day moved backward in relation to the seasons one day every four years, thus wandering through all the seasons in the course of 1,460 years. However, the difference in one lifetime was not great, and throughout the 5th century B.C., with which this study is concerned, the Egyptian New Year's Day fell in December. From the Egyptian solar calendar was derived the Julian calendar, still in use today, with slight modifications, under the name of the Gregorian calendar.

The Mesopotamian peoples, on the other hand, developed a luni-solar year[3] by which the months were regulated by the length of the moon's rotation around the earth, and in which 12 lunar months, varying between 29 and 30 days, made up an ordinary year. Since such years were 10 to 11 days shorter than a solar year, in every 2d or 3d year an extra month was inserted in the middle or at the end to bring the calendar year in harmony with the seasons. The New Year's Day was celebrated on Nisan 1, in the spring, and fell in

[2] See pp. 34-45.
[3] See pp. 37, 47-50.

March or April. The Persian rulers adopted this calendar system when they gained possession of the Babylonian empire.

The Biblical evidence shows that the Jews had a luni-solar year like the other nations of Western Asia,[4] but their intercalary months were apparently inserted only between the 12th and 1st lunar months in the spring, not between the 6th and 7th also, as was frequently done in Mesopotamia. The Bible shows us, furthermore, that the Jews employed two calendar years, one—introduced by Moses—for religious purposes, which like the Babylonian calendar began with Nisan in the spring, and another one for civil and agricultural purposes, beginning with the first of Tishri in the fall. The numbering of the months, however, was always begun with Nisan; for example, the number "seven" was employed for Tishri, whether that month was referred to as part of the ecclesiastical or the civil year.[5]

Systems used to count Persian regnal years.—During the period of the Persian Empire, when one king ruled over many formerly independent nations, dating throughout the empire was done according to the regnal years of Persian kings. However, the subject peoples retained their own systems of reckoning such regnal years.

The evidence of Ptolemy's Canon[6]—known for a long time—seemed to indicate that the years of the

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[4] See Chapter III.
[5] See p. 72.
[6] See pp. 42-45.

Persian kings were reckoned in Egypt according to the Egyptian calendar. The Elephantine papyri have provided contemporary source material showing that this was so. They have also shown that the Egyptians did not use the accession-year system, as did the Babylonians and Persians, but counted the regnal years of Persian kings as they had formerly done with their own kings, using the non-accession-year system. It is also evident that they began each regnal year with their own New Year's Day, which fell four to five months before the Persian one in the 5th century B.C.,[7] so that there was only a partial overlapping between the regnal years of the king according to the Egyptian and Persian systems of reckoning. Thus in any date that fell between the Egyptian and Persian New Year's Days, the Egyptian regnal-year number was always higher by one than the Persian.

The Biblical evidence shows that the Jews had used the accession-year system in the Babylonian period, so that it could be assumed that they retained this method after the Exile in common with Persian practice. This conclusion has proved to be correct by the contemporary Jewish documents from Elephantine.[8]

The Bible also indicates, through the information given by Nehemiah, that the Jews in Palestine counted the years of Artaxerxes I according to their own civil calendar, which began in the fall (Tishri). Those who

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[7] See pp. 77-79.

[8] The fact that the Jewish year runs later than the Persian in *AP 6*, *25*, and *28* shows that the Jews used an accession year before the 1st year.

have accepted Nehemiah's statements as reliable source material have held that his method of dating the regnal years of a Persian king according to a fall-to-fall calendar was not due to his idiosyncrasy but was a common practice among the Jews, which can be traced back from Nehemiah's time to the reign of King Solomon.

From these indications the conclusion can be reached that the years of Artaxerxes I were counted by Ezra and Nehemiah according to their own system, so that each of his regnal years was the same according to the Persian and Jewish systems of reckoning during one half year but differed during the other half year.

Two key problems.—The establishment of the correct dates for the events described in Ezra 7, with which this study is concerned, hinges on two key problems. The first one is to determine whether the Jews of Nehemiah's time actually reckoned the years of the Persian kings according to their own civil fall-to-fall calendar. The second problem is to find the exact time of Artaxerxes' accession, in order to determine whether the regnal years in the Jewish fall-to-fall reckoning ran earlier or later than the corresponding Persian years.

Evidence for the Jewish fall-to-fall calendar.—The first problem existed since the reliability of Nehemiah's statements has been challenged, and it was thought by many scholars that scribal errors might be involved in his figures. It was therefore desirable to obtain extra-Biblical dated Jewish documents to give us more information about the Jewish calendars. Although hundreds

of thousands of dated cuneiform tablets are available for the establishment of the Babylonian calendar, which was used also by the Persians, and hundreds of documents inform us about the ancient Egyptian calendar, only a few well-preserved Jewish documents of the 5th century B.C. were available until very recent times for the Jewish calendar.

The recent discovery, in the Brooklyn Museum, of 8 fairly well-preserved, dated Aramaic papyri of the same period has increased to 14 the number of double-dated documents available for a reconstruction of the Jewish calendar. Though this is still a small number in comparison with the wealth of material that sheds light on the Egyptian and Babylonian calendars, these papyri are nevertheless of great importance for the study of the chronology of Ezra, since they all come from the same period.[9]

Although all of these 14 documents bear double dates—Jewish and Egyptian—ten of them mention the year number of the Persian king only according to the Egyptian system of reckoning, which was apparently a legal requirement in Egypt, where the writers of these documents lived. They naturally do not throw any light on the Jewish calendar. Two papyri contain the Jewish as well as Egyptian year numbers, showing a difference of one year between them in each case. Unfortunately, both of them come from a portion of the year in which there was no difference between the year numbers in

[9] For the Aramaic papyri and their bearing on the Jewish fall-to-fall reckoning, see pp. 72-88.

the Persian and Jewish systems of reckoning, and the difference between the Egyptian and Persian systems of reckoning was equal to the difference between the Egyptian and Jewish systems.

Two papyri contain the regnal year number of the Persian king according to the Jewish system of reckoning, but one of them again comes from that portion of the year when there is no difference between the Persian and Jewish way of reckoning regnal years, so that this papyrus contains once more no proof for a different method used by the Jews. One of the newly discovered papyri, however, which contains only the regnal year of the Persian king according to the Jewish way of reckoning (*Kraeling 6*),[10] comes from that half year which lies between Nisan and Tishri, when there was a difference between the Persian and Jewish regnal numbering. Hence, it shows clearly that the Jews used a fall-to-fall calendar in their reckoning of regnal years of Persian kings, as Figure 4 illustrates.[11]

The only other explanation for this papyrus would be the assumption of a scribal error, an explanation that has also been used by higher critics for the statements of Nehemiah that point to a fall-to-fall calendar of the Jews. Since the new papyrus, however, forms an independent support for Nehemiah's practice, there is no reason to assume the existence of scribal errors in either case—the book of Nehemiah or the Elephantine document. The new evidence thus shows clearly that the

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[10] See pp. 82-86.
[11] See p. 84.

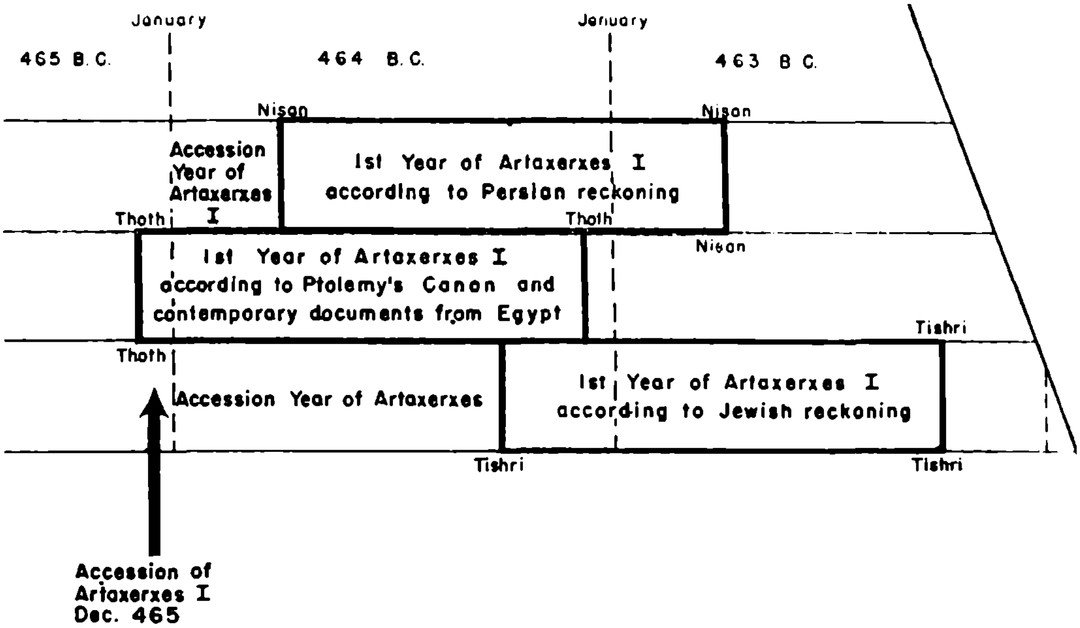


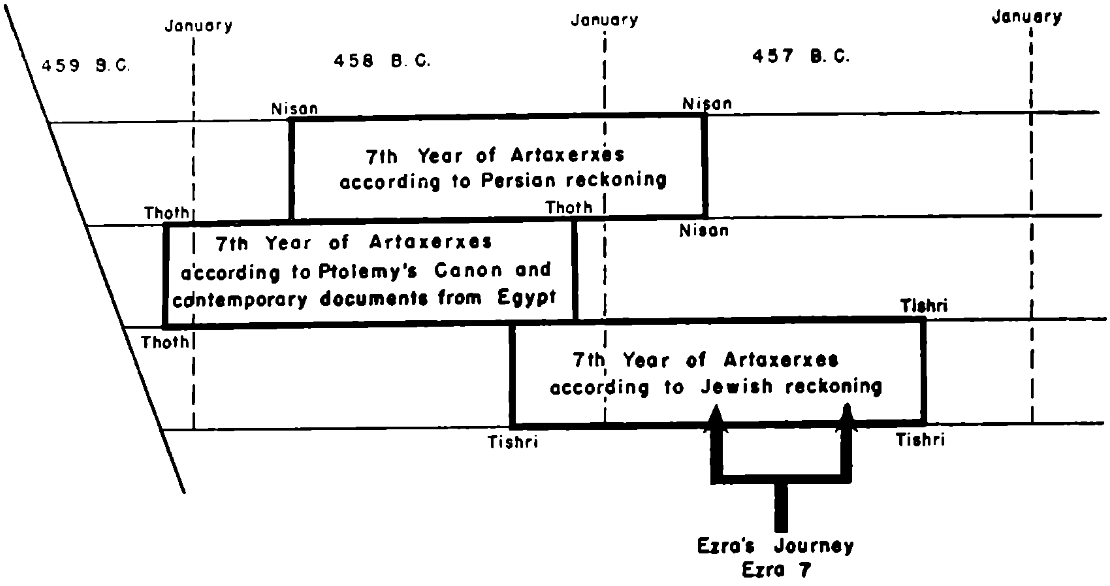
Fig. 6. The First and Seventh

The relationship of the Persian, Egyptian, and Jewish calendar years of Artaxerxes, indicating how it came

Jews in Elephantine used a fall-to-fall calendar as their contemporaries in Judah did.

The accession of Artaxerxes determined.—The solution of the second problem is needed in order to determine whether this regnal year of Artaxerxes I according to Jewish reckoning preceded or followed that of the Persians.[12] If he began to reign between Nisan and Tishri, the following Jewish New Year would come before the Persian New Year; hence Jewish years would run 6 months ahead of the Persian years, for the Jews, beginning the first year of the king in Tishri, counted it as such while it was still the accession year for the Persians until the next spring. If he came to the throne between Tishri and Nisan, the Persian year 1 would begin first in Nisan, but the Jews would continue to

[12] See Chapter V.



Years of Artaxerxes I

years to the Julian calendar is shown for the first and seventh that Ezra's journey took place in 457 B.C.

count that regnal year of the king as accession year until the next Tishri, 6 months behind the Persian year.

If the exact time of accession of a king is not ascertainable, an uncertainty remains as to which Jewish year is the accession year and which the 1st year, and the conversion of a Jewish date into the Julian calendar may be off by one year. For Artaxerxes I, with whom this study is especially concerned, such an uncertainty existed until very recent times. The only document dated in the calendar year in which Xerxes' death and Artaxerxes' accession occurred, gave us merely the information that Artaxerxes had come to the throne before Jan. 2, 464 B.C. But it was not certain whether his accession to the throne had occurred recently—although that was probable—or before Tishri, several months before Jan. 2, 464 B.C.

A tablet from Ur, the first one that has ever been

found giving us a date in the death year of Xerxes, now furnishes the information that at Ur, Xerxes was believed to be alive on Dec. 17, 465 B.C.[18] Therefore we can conclude with great certainty that Artaxerxes did not come to the throne before December, 465 B.C. The Jews thus counted the time from December, 465 B.C., to the fall of 464 as his accession year, and his regnal years began always 6 months later according to Jewish reckoning than according to the Persian count. (Fig. 6.)

Artaxerxes' decree effective in 457 B.C.—The solution of the two problems by recent archeological material has based the dating of the events described in Ezra 7 on a sure foundation. The Aramaic papyrus *Kraeling 6* written by Jews in Elephantine shows that the Jews there used a fall-to-fall calendar for reckoning the regnal years of a Persian king, and an Ur Tablet indicates that Artaxerxes I came to the throne in December, 465 B.C.

Consequently, Jews who used a fall-to-fall calendar for expressing the regnal years of Artaxerxes I began the counting of his first year in the fall of 464 B.C. and ended that first year in the fall of 463 B.C. as Figure 6 illustrates. According to this method the 7th year began in the fall of 458 B.C. and ended in the fall of 457.

Since this method of reckoning the regnal years of Persian kings can be shown to have been used by Nehemiah in Palestine, and his compatriots in Egypt, it is only reasonable to conclude that Ezra, Nehemiah's predecessor and colaborer, did the same. In that case

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[18] See pp. 100-103.

Ezra's journey, which began in the month of Nisan of the 7th year of Artaxerxes and ended in Ab (5th month), took place from late March to late July in 457 B.C., and the decree of Artaxerxes I went into effect after Ezra's arrival in Palestine in late summer or early fall of that same year.

Appendix

THE FIFTH-CENTURY JEWISH CALENDAR AT ELEPHANTINE

The only 5th-century documents shedding light on the calendar of the Jews during the time of Ezra and Nehemiah are the Aramaic papyri from Elephantine and one stone monument in the Cairo Museum. The papyri, numbering more than 100, throw welcome light on the language, history, and everyday life of a Jewish garrison town in Egypt; and a number of these papyri form exceedingly important source material for the study of the calendar in use among the Jews during the 5th century B.C. Thirty-eight of the documents are dated, 22 of them bearing double dates—the Egyptian date and one which was used by the Jews, employing Babylonian month names. Since the Egyptian dates can easily be converted into those of the Julian calendar, means are thus provided for ascertaining the nature of the calendar used by the Elephantine Jews.[1]

Immediately after the publication of the first group of papyri,[2] several scholars attacked the problems involved

[1] A synchronism between the known Egyptian calendar (see pp. 40-42) and variable lunar calendar (see pp. 47-50) makes it possible to date a double-dated papyrus correctly. If the Egyptian regnal-year number is known, the Egyptian month and day are sufficient to fix the B.C. date in the Julian calendar; but even if the exact location of the regnal year is uncertain, the double solar-lunar dating can determine the year as well as the month and day.

The reason for this can best be given by a concrete example. The regnal year 3 of Darius II in *Kraeling 6* (see Fig. 4, p. 84) might conceivably be either the Egyptian year 3, placing the document in 421 B.C., or the Jewish fall-to-fall regnal year 3, which would place the papyrus in 420 B.C. The Egyptian date alone does not determine which is correct, because Pharmuthi 8, moving back one day only every four years, is July 11/12 in both years. But the lunar date Tammuz 8 can agree with July 11/12 in only one of those years—in fact, only once in a number of years—since it shifts not less than 10 days from one year to the next. This illustrates the fact that any synchronism between solar- and lunar-calendar dates can occur in only one year within a range of several possible years (in this case, 420 B.C.), and the double date can thus locate a disputed regnal year independently of Ptolemy's Canon or the Saros Tablets.

[2] See p. 74, footnote 9.

in their dates and the calendar system used. E. Schürer[3] was one of the first who discussed the dates of these documents. He was followed by F. K. Ginzel.[4] Both of them started out from the hypothesis that the Jews of the 5th century had a lunar calendar like the Persians, and that they began every month after the visibility of the new moon as in Babylon. Irregularities and disagreements in the dates were explained as scribal mistakes. L. Belleli, however, tried to prove by the apparently inexplicable disagreements between some of the dates that the documents were modern forgeries,[5] but very few scholars could believe that papyri found by a scientific expedition—as the majority of the papyri had come to light in this way—could have been dumped on the site by forgers who would have to profit from the discovery of the documents. Since the excavated papyri show the same characteristics as those bought from natives, no doubt in the genuineness of any of them can be reasonably entertained.

The astronomer E. B. Knobel showed from papyri *AP 13* and *25* that a 19-year cycle was known to the Jews in the 5th century B.C., as their system of intercalation shows. He concluded from his findings that the Jewish civil calendar was computed, and that the civil year began with Tishri 1.[6] The well-known British astronomer J. K. Fotheringham came similarly to the conclusion that the computed calendar and the year beginning with Tishri 1 were used, and

[3] Schürer, Book review: "Aramaic Papyri discovered at Assuan, edited by A. H. Sayce with the assistance of A. E. Cowley . . . London, A. Moring, 1906, . . ." *Theologische Literaturzeitung,* 32 (1907), cols. 1-7; also his "Der jüdische Kalender nach den aramäischen Papyri von Assuan. Nachtrag zu der Anzeige in Nr. 1," *ibid.,* cols. 65-69.

[4] Ginzel, *Handbuch der mathematischen und technischen Chronologie,* vol. 2, pp. 45-52.

[5] L. Belleli, *An Independent Examination of the Assuan and Elephantine Aramaic Papyri.*

[6] E. B. Knobel, "A Suggested Explanation of the Ancient Jewish Calendar Dates in the Aramaic Papyri Translated by Professor A. H. Sayce and Mr. A. E. Cowley," *Monthly Notices of the Royal Astronomical Society,* 68 (1907-1908), pp. 334-345; also his "Note on the Regnal Years in the Aramaic Papyri From Assuan," *ibid.,* 69 (1908-1909), pp. 8-11.

also that the intercalation was arbitrarily done by the insertion of a second Adar, without the use of a second Elul.[7]

The chronologist E. Mahler agreed with Knobel and Fotheringham that the Jewish calendar was based neither on the visibility of the first crescent nor on the conjunction, but on the application of a regular cycle. However, he believed that the Jewish fall-to-fall calendar was a later institution.[8]

Martin Sprengling, on the other hand, reached entirely different conclusions. Maintaining that the Jewish civil year, beginning with Tishri, was a later development, he held that the Elephantine papyri attest a year that began with Nisan, and that the Jews of the 5th century used a second Elul, but dropped it later on.[9] It is not necessary to review in detail the work of P. J. Hontheim, J.-B. Chabot, J. G. Smyly, D. Sidersky, and H. Pognon,[10] because their reasonings vary only in some details from the various conclusions reached by the scholars already mentioned. It should be stated, however, that S. Gutesmann thought the Jews possessed a 25-year cycle instead of the Babylonian 19-year cycle.[11] This theory has found no acceptance, since the double-dated papyri would have to show

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[7] J. K. Fotheringham, "Calendar Dates in the Aramaic Papyri from Assuan," *ibid.*, 69 (1908-1909), pp. 12-20; also his "Note on the Regnal Years in the Elephantine Papyri," *ibid.*, pp. 446-448; and his "A Reply to Professor Ginzel on the Calendar Dates in the Elephantine Papyri," *ibid.*, 71 (1911), pp. 661-663.

[8] Eduard Mahler, "Die Doppeldaten der aramäischen Papyri von Assuan," *Zeitschrift für Assyriologie*, 26 (1912), pp. 61-76; also his *Handbuch der jüdischen Chronologie*, pp. 346-360.

[9] Martin Sprengling, "Chronological Notes From the Aramaic Papyri, . . ." *AJSL*, 27 (1911), pp. 233-252.

[10] P. J. Hontheim, "Die neuentdeckten jüdisch-aramäischen Papyri von Assuan," *Biblische Zeitschrift*, 5 (1907), pp. 225-234; J.-B. Chabot, "Les papyri araméens d'Eléphantine sont-ils faux?" *Journal Asiatique*, 10th series, vol. 14 (1909), pp. 515-522; J. Gilbart Smyly, "An Examination of the Dates of the Assouan Aramaic Papyri," *Proceedings of the Royal Irish Academy*, vol. 27, sec. C (1908-1909), pp. 235-250; D. Sidersky, "Le calendrier sémitique des papyri araméens d'Assouan," *Journal Asiatique*, 10th series, vol. 16 (1910), pp. 587-592; H. Pognon, "Chronologie des papyrus araméens d'Eléphantine," *ibid.*, vol. 18 (1911), pp. 337-365.

[11] S. Gutesmann, "Sur le calendrier en usage chez les Israélites au Ve siècle avant notre ère," *Revue des études juives*, 53 (1907), pp. 194-200.

the use of such a 25-year cycle over a larger period than is covered by the extant documents. Inasmuch as such a cycle was not employed anywhere else in the ancient world, it seems unlikely that the Jews should have used it.

R. A. Parker, whose study seems to be the last one that has appeared on this subject, holds the view that the Elephantine papyri express their dates in terms of the existing Persian, i.e. Babylonian, calendar.[12] He holds, furthermore, that divergences thus found between the Egyptian and Babylonian dates are due to mistakes made by the scribes, who as foreigners were not very familiar with the Egyptian calendar and therefore apt to confuse dates.[13]

The different views found in the numerous studies dealing with the dates of these papyri reveal that no unassailable conclusions have yet been reached. Most scholars, however, agree that a 19-year cycle was in use among the Jews of the 5th century B.C. Many also agree that the Jewish calendar was not completely synonymous with the Babylonian calendar, unless every divergence is explained as a scribal error.

With regard to other points there is much difference in opinion. Whether the Jews began their civil year with Nisan or Tishri, whether they made use of a second Elul besides the second Adar, and whether the intercalation was carried out regularly are disputed questions.

The great increase in the number of dated documents through the discovery of the Brooklyn Museum papyri makes a re-examination of the whole problem urgent. They are leading us a step further on the way to the final solution, as the following discussion will show. Although we are not yet able to explain every phase of the Jewish calendar method of the postexilic period, we actually know

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[12] Richard A. Parker, "Persian and Egyptian Chronology," *AJSL*, 58 (1941), pp. 288-292.

[13] Parker, in a personal letter to S. H. Horn, November 19, 1952.

much more about it through these papyri than for the period of the first Christian century.

Procedures followed.—In the study of these papyri the first step will be to convert the Egyptian date into terms of the Julian calendar, which is a comparatively easy matter, as was shown in chapter 1, because of the invariable 365-day solar year used by the ancient Egyptians. The date arrived at in this way will cover parts of two Julian calendar days, since the Egyptian day began at dawn. Therefore, two figures will have to be used, and the formula July 7/8 (sr-sr),[14] 465 B.C., designates an Egyptian day that lasted from July 7 at dawn to July 8 at dawn in 465 B.C.

Since the Jews and Babylonians began the day at sunset, their day also overlaps two Julian calendar days, and Jewish dates will henceforth also be indicated by two figures. Thus July 7/8 (ss-ss),[15] 465 B.C., means the day which began at sunset July 7 and ended at sunset July 8. Thus the Egyptian day did not coincide exactly with the day as reckoned by any of the other peoples mentioned. Hence a legal document signed on the Egyptian day July 7/8 (sr-sr) would give two possible dates in terms of a Jewish calendar, depending on the part of the day when the signing of the document occurred. If it was signed before sunset, it would be dated to an earlier Jewish date than if it was signed after sunset.

If therefore a double-dated papyrus equates a certain Egyptian date with one of the Jewish calendar, it is still uncertain whether the Jewish day referred to began the evening preceding the Egyptian date mentioned, or on the evening of that Egyptian day. The Jews had a lunar calendar, in which the first day of the month must begin a

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[14] It is generally held by scholars that the Egyptian day began at dawn. For practical purposes there is no difference between dawn and sunrise; hence the abbreviation "sr-sr" is used for sunrise to sunrise in contrast to the Jewish day, which lasted from sunset to sunset.

[15] The abbreviation "ss-ss" stands for sunset to sunset.

reasonable time after the conjunction (at least not much less than one day later). Our conclusions will therefore lead us in a few cases to assume that a document was made up after sunset,[16] if otherwise the time between conjunction and the beginning of the first day of the month at sunset would become too small to be reasonable. Thus it must be recognized that an uncertainty of one day cannot be avoided, because of the facts that (1) the Egyptian and Jewish days did not completely overlap, and (2) that the scribes in no case indicated during which part of the day the documents were written.

The Elephantine papyri were written for the most part in the time when Egypt was a Persian satrapy; therefore the dated papyri are with one exception (*AP 35*) dated according to regnal years of Persian kings. However, the Egyptian reckoning of the regnal year of a given Persian king began with Thoth 1, which during the 5th century B.C. fell about four months before Nisan, the first month of the Babylonian calendar, and about 10 months before Tishri, the first month of the Jewish civil calendar, as has been demonstrated.[17] Hence, any Egyptian document dated after Thoth 1, and before either the Persian or Jewish New Year's Day, had a regnal-year number which was higher by one than the corresponding Persian or Jewish year number.

It has already been shown that with very few exceptions the regnal-year numbers are given according to the Egyptian system of reckoning such years. This seems to have been required in Egypt for all legal documents, such as the double-dated papyri.[18]

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[16] For "sunset" a mean is taken, for the purposes of this study, at 6 P.M. Elephantine civil time (that is, local time at Elephantine, counted from midnight), although this time naturally varied somewhat during the seasons of the year.

[17] See pp. 76-78 and Fig. 3, for the Persian system, and pp. 82-85 and Fig. 4 for the Jewish in relation to the Egyptian.

[18] See pp. 78-80.

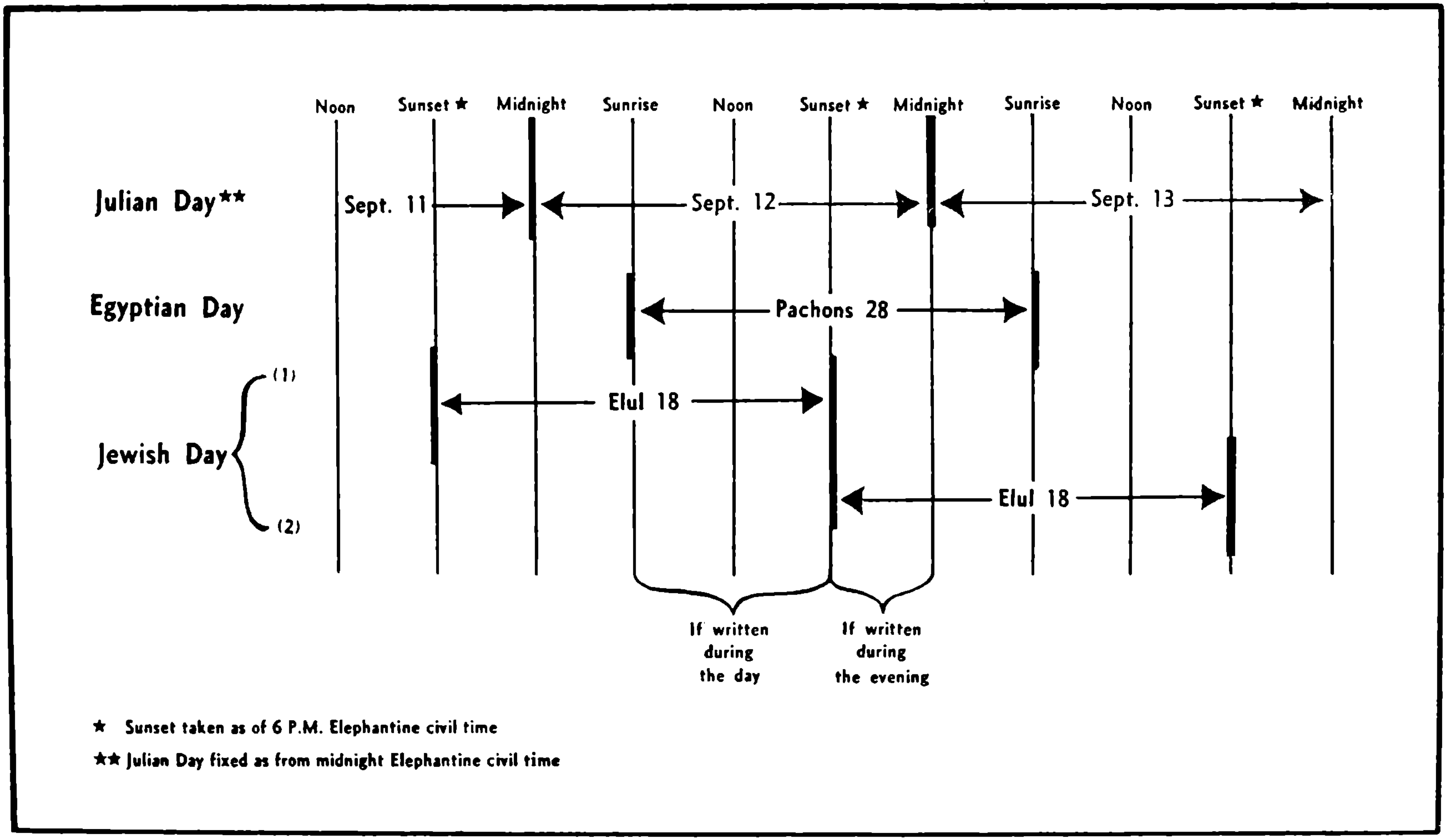


Fig. 7

The Differences in the Julian, Egyptian, and Jewish Days

The differences in the Julian, Egyptian, and Jewish days is shown, indicating that if a document was written during the Egyptian day Pachons 28, the corresponding Elul 18 could have been either the Jewish day that began at the preceding sunset or the day that began at the sunset of Pachons 28.

After having briefly explained the procedures followed in the interpretation of the double dates, we shall proceed to their discussion, taking them up in chronological sequence. The reader who has carefully read chapters I and II should find no difficulty in understanding the following discussion.

AP 5. Elul 18 = Pachons 28, year 15 of Xerxes (471 B.C.)

The 15th year of Xerxes is the year 277 of the Nabonassar era of Ptolemy's Canon beginning Dec. 19, 472 B.C., and lasting through Dec. 18, 471 B.C. Pachons 28 fell on Sept. 12/13 (sr-sr), 471 B.C. Since the Jewish day began at sunset, as has already been explained, Elul 18 would not coincide exactly with Pachons 28, but would overlap parts of two Egyptian days. Therefore, as Figure 7 shows, there are two possibilities: (1) Sept. 11/12 (ss-ss) if the agreement was drawn up during the hours of the day, or (2) Sept. 12/13 (ss-ss) if it was written after sunset of Sept. 12. This would then result in two possible dates for Elul 1 (see Fig. 8), either (1) Aug. 25/26 (ss-ss) if the document was written during the hours of the day, or (2) Aug. 26/27 (ss-ss) if it was written after sunset.

Since the preceding conjunction of the moon took place Aug. 24.78 (= Aug. 24 at 6:43 P.M. Elephantine civil time, counted from midnight), the translation period amounted to .97 of a day (23 hours, 17 minutes) if Aug. 25/26 (ss-ss) was Elul 1, or 1.97 days (47 hours, 17 minutes) if Aug. 26/27 (ss-ss) was Elul 1. Not until all the various papyri have been discussed can we reach reasonable conclusions. Hence we have to defer making a decision as to which of the two dates mentioned was Elul 18.

AP 6. Kislev 18 = Thoth [17], year 21, the beginning of the reign of Artaxerxes I (464 B.C.)

The Egyptian day number is broken. Cowley suggested restoring it to 7 or to 14; Gutesmann and Hontheim

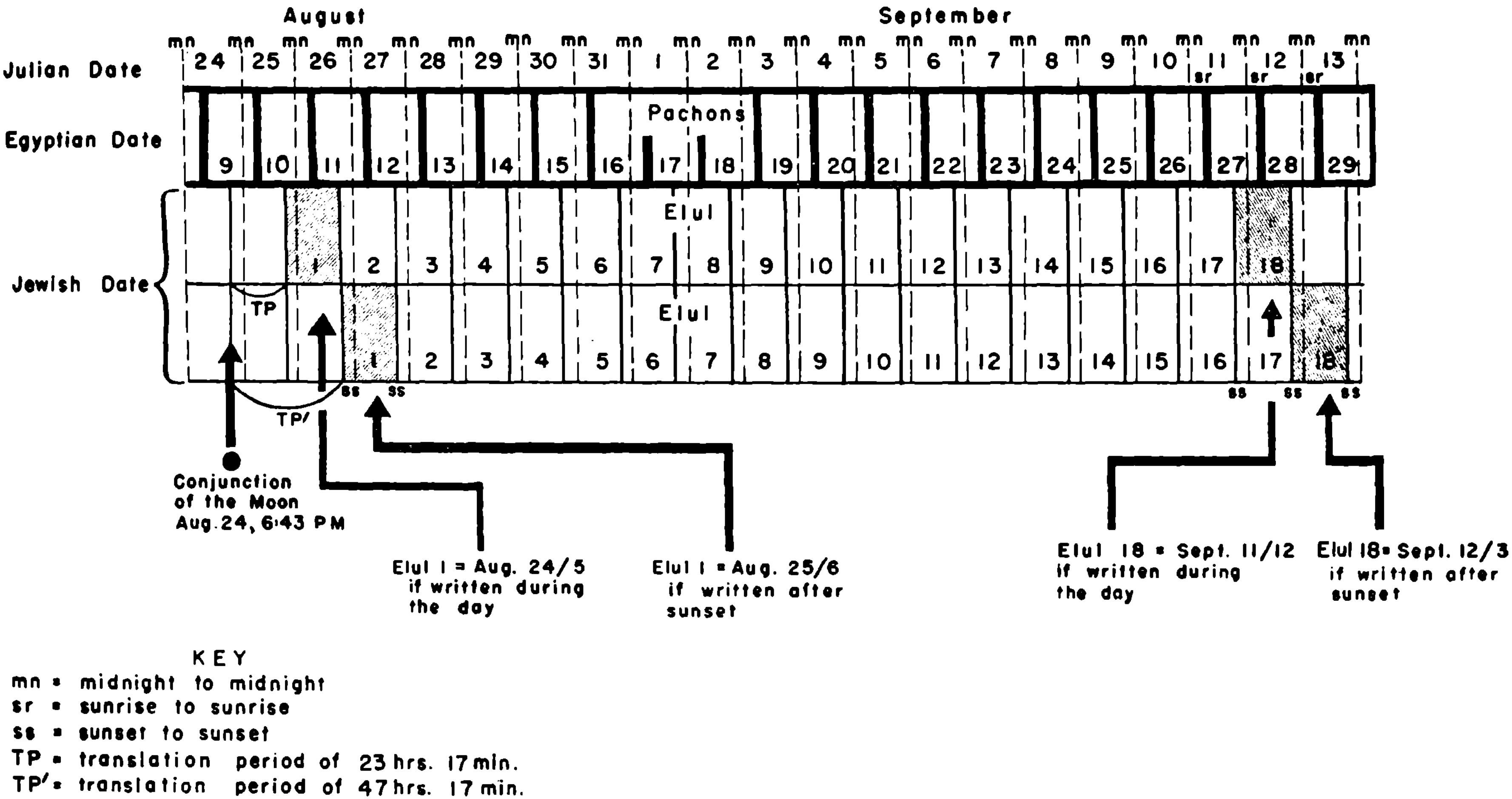


Fig. 8

The Two Possible Dates for a Double-dated Papyrus Illustrated by Papyrus *AP* 5

Since the differences in day beginning between the Egyptian and Jewish days allow two theoretical possibilities for the placing of the Jewish day, the length of the translation period at the beginning of the month has to decide which scheme is most likely the correct one. The range of the translation period lies between 16½ and 42 hours, hence the first case, in which the translation period was 23 hrs. 17 min., is correct, and the document was written before sunset.

restored it to 17.[19] No other restorations are paleographically possible. A ¾-inch break in the papyrus obliterates part of the number, leaving four vertical strokes. In this break the last two characters of the word יום "day" have to be supplied, since only the letter י is extant. The remaining gap is then about half an inch. It can be filled with three strokes, making the number 7. This actually gives paleographically the best picture as the accompanying reproduction (Plate 1-A) shows. The restoration of a "ten" in the gap does not fill it well (Plate I-B) and the figure 14 can therefore be disregarded. The insertion of the figure for 10 followed by 3 strokes, making the figure 17 (Plate I-C) is the only day number that can be made to agree astronomically with Kislev 18, but it must be admitted that the figure looks rather crowded, as Plate I-C shows.

This papyrus is important, since it seems to equate the 21st year of one king with the accession to the throne of a king Artaxerxes. Since only Artaxerxes I succeeded to the throne in the 21st year of his predecessor (Xerxes), this latter king's name must be inferred.

In contrast to the usual method of the Jews in Elephantine, of giving only the Egyptian year if only one is mentioned, this is one of the two exceptional cases (also *Kraeling 6*) where only the Persian or Jewish year number is given instead.

The 21st year of Xerxes, which was also the accession year of Artaxerxes I, began in the spring of 465 B.C. according to the Persian system of reckoning, and in the fall of the same year according to the Jewish civil year. The month Kislev, the 9th month of the Babylonian calendar, always fell toward the end of the Julian calendar year—thus from December, 465, to January, 464 B.C., during the year under discussion. The Egyptian month Thoth of

[19] Cowley, *op. cit.*, p. 17.

that period began Dec. 17, 465, and ended Jan. 15, 464 B.C. That only Thoth 17 can be made to agree with Kislev 18 can be seen from the following results:

Thoth 7 = Dec. 23/24 (sr-sr), 465 B.C.
Thoth 14 = Dec. 30/31 (sr-sr), 465 B.C.
Thoth 17 = Jan. 2/3 (sr-sr), 464 B.C.

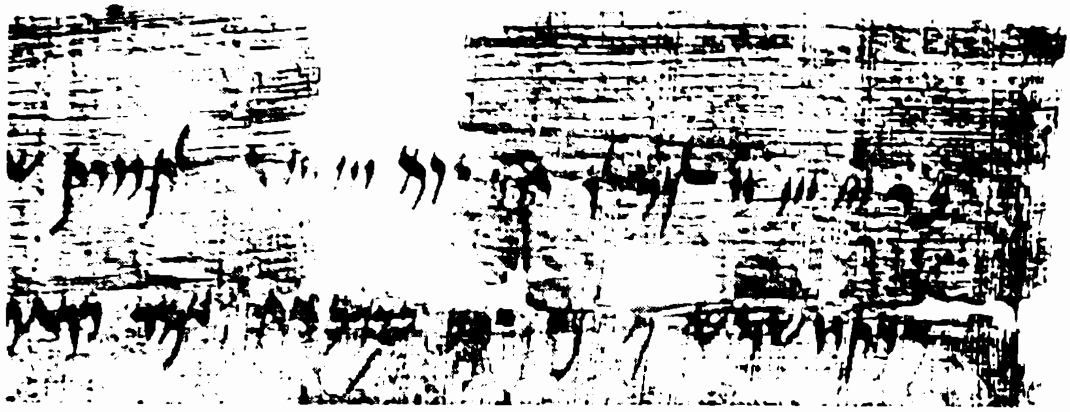
The conjunction of the moon took place Dec. 15.04 (12:57 A.M.), 465 B.C. The earliest date possible for Kislev 1 would be Dec. 15/16 (ss-ss), 465 B.C., and the 18th of Kislev would then be Jan. 1/2 (ss-ss), 464 B.C.

If Kislev 1 was Dec. 15/16 (ss-ss), 465 B.C., the translation period amounted to .71 of a day (17 hours, 2 minutes); if Kislev 1 was Dec. 16/17 (ss-ss), the translation period would be 24 hours longer (41 hours, 2 minutes), and the document would have been written in the evening after sunset, since Kislev 18 would in that case have been Jan. 2/3 (ss-ss), 464 B.C.

AP 8. Kislev 21 Mesore 1, year 6 of Artaxerxes I

The papyrus is well preserved and creates no reading problems. However, the dates as given can be made to agree by no known methods, so that a scribal error must be involved. If the scribe mistakenly wrote Mesore 1 instead of a correct Mesore 21 the dates agree astronomically, though not with the Babylonian calendar. They are also in harmony if the months and day numbers are assumed to be correct, with the year 6 an error for year 5. But again no agreement would exist with the Babylonian calendar. The two possible results would be the following:

1. Kislev 21 = Mesore 1, year 5 (?) of Artaxerxes I (460 B.C.). Mesore 1 in the year 5 of Artaxerxes I's Egyptian regnal year (288th year of the Nabonassar era) fell on Nov. 11/12 (sr-sr), 460 B.C. Kislev 21 would then have been either Nov. 10/11 (ss-ss) or Nov. 11/12 (ss-ss), and Kislev 1 either Oct. 21/22 (ss-ss) or Oct. 22/23 (ss-ss). Since the



A. Day Number Reconstructed to "7"

B. Day Number Reconstructed to "11"

C. Day Number Reconstructed to "17"

Plate I

The Break in the Date Line of Papyrus *AP 6* Reconstructed According to Three Possibilities

Since only one letter of the word "day" is preserved, the two missing characters of that word had to be put into each reconstruction. The three vertical strokes stand for the numeral three, the crescent-shaped sign is the numeral ten.

conjunction of the moon took place Oct. 21.09 (2:09 A.M.), the translation period would have amounted to .66 of a day (15 hours, 50 minutes) in the first case, and 1.66 days (39 hours, 50 minutes) in the second. However, it should be noticed that Kislev 1 was one lunar month later according to the Babylonian calendar.

2. Kislev 21 = Mesore 21 (?), year 6 of Artaxerxes I (459 B.C.). Mesore 21 in the 6th Egyptian year of Artaxerxes I fell on Dec. 1/2 (sr-sr), 459 B.C. Kislev 21 was therefore either Nov. 30/Dec. 1 (ss-ss) or Dec. 1/2 (ss-ss), 459 B.C., and Kislev 1 either Nov. 10/11 or Nov. 11/12 (ss-ss). The conjunction took place Nov. 9.14 (3:21 A.M.), and the translation period would have been 1.61 days (38 hours, 38 minutes) or 2.61 days (62 hours, 38 minutes). Again if the results were correct, Kislev would have been a whole month earlier than according to the Babylonian calendar.

If the date line of the papyrus needed no emendation to achieve an agreement with astronomical facts, we should have the proof here that the Jews of Elephantine had failed to observe a second Adar in harmony with the Babylonian year in 462 B.C.,[20] and had not inserted it during the years 461 and 460; in that case they were one lunar month behind the Babylonian calendar. Unfortunately, these results are gained through conjectural corrections of the date line of *AP 8,* which make them rather doubtful. If another mistake is involved, different from those two conjectures, the results may be different.

AP 9. Year 6 of Artaxerxes I

The document is related to *AP 8* and may have borne the same date, perhaps without a scribal error. The date line, however, is so badly preserved that no certain conclusions can be reached.

[20] However, it should not be forgotten that the second *Addaru* in Parker and Dubberstein's tables (*op. cit.,* p. 30) is still unattested, although its insertion in 462 B.C. is probably correct there.

Cairo Sandstone Stele.*[21] בירח *Sivan = Mechir, year 7 of Artaxerxes I (458 B.C.)

Because of the wide range of this date and its ambiguity, this stele does not settle the problem raised by *AP 8*. If the 7th year of Artaxerxes is recorded here according to the Egyptian system of reckoning, as is most likely the case, it is the 290th year of the Nabonasser era, beginning Dec. 16, 459, and ending Dec. 15, 458 B.C. The month Mechir of the 7th year of Artaxerxes I as reckoned in the Egyptian calendar extended from May 15 through June 13, 458 B.C. The month Sivan according to the Babylonian calendar extended from June 6 through July 5, 458 B.C.,[22] or according to the hypothetical reconstruction of the Elephantine calendar based for those years on *AP 8* (in which the months of the Jewish calendar preceded those of the Babylonian calendar by one lunar month), from May 8 through June 5, 458 B.C.

If the word בירח of the inscription is to be read "in the month," it can fit both schemes, since Sivan 1-8 of the Babylonian calendar overlapped with the last 8 days of the Egyptian month Mechir, and Sivan 8-29 according to the hypothetical Jewish calendar based on *AP 8* overlapped with the first 22 days of Mechir also. If, however, בירח means "on the first day of the lunar month,"[23] only a calendar in which the months coincided with the Babylonian months can be meant, since the first day of Sivan of the supposed Jewish calendar did not fall in Mechir.

Kraeling 14. Iyyar [8] = Tybi 20

In this badly broken marriage document the name and regnal-year number of the king are missing. Only five

[21] For the monument, see M. le Marquis Melchior de Vogüé, "Inscription araméenne trouvée en Egypte," *Comptes rendus des seances de L'Académie des Inscriptions et Belles-Lettres*, July 3, 1903, pp. 269-276, and Plate.

[22] Parker and Dubberstein, *op. cit.*, p. 30.

[23] As Professor Kraeling suggested orally to S. H. Horn.

strokes of the day number of Iyyar are preserved. The preceding gap seems to allow a restoration to the number 8, the only possible date which agrees with Tybi 20 (well preserved) during the whole 5th century B.C.[24] A careful analysis of all years during the 5th century—the period in which these papyri were written—leads to the conclusion that Iyyar 8 agrees with Tybi 20 only five times, once during the reign of Darius I, in 496 B.C.; twice under Xerxes, in 482 and 471 B.C.; and twice during the reign of Artaxerxes I, in the years 457 and 446 B.C. It seems unnecessary to present the calendrical evidence for each one of these dates, since the fragmentary state of this document and the absence of a royal name do not permit a final conclusion for any of the five possible dates.

Kraeling 1. Phamenoth 25 = Sivan 20, year 14 of Artaxerxes I (451 B.C.)

Although the scribe used an unusual sequence in this papyrus, giving the Egyptian month first—a method followed only once more, in *Kraeling 6*—the year number was, as in most cases, the Egyptian regnal year of Artaxerxes I, because no harmony between the dates could be achieved if year 14 was meant to be counted according to the Jewish reckoning. The reversed sequence must therefore be ascribed to a scribal slip.

Phamenoth 25 in Artaxerxes I's 14th Egyptian regnal year was July 6/7 (sr-sr), 451 B.C. Sivan was consequently either July 5/6 (ss-ss) or July 6/7 (ss-ss). The conjunction of the moon took place June 16.59 (2:09 P.M.), giving a translation period of .16 of a day (3 hours, 50 minutes) if Sivan 1 was June 16/17 (ss-ss), or 1.16 days (27 hours, 50 minutes) if Sivan 1 was June 17/18 (ss-ss), 451 B.C.

[24] A restoration of the number to 15 or 25 is impossible since Iyyar 15 or 25 never coincided with Tybi 20 during the 5th century B.C.

Kraeling 2. [Tammuz] 18 = Pharmuthi [3], year 16 of Artaxerxes I (449 B.C.)

The Jewish month name and the Egyptian day number are broken away in the papyrus. They are restored here on the basis of calendrical computations, since Tammuz is the only Jewish month which has an 18th day that will synchronize with any day of the month Pharmuthi in the 16th Egyptian regnal year of Artaxerxes I. The day number 3 for Pharmuthi is restored because it gives the best translation periods. In view of some of the low translation periods of the previous papyri, Pharmuthi 2 as the correct Egyptian date cannot be ruled out entirely as impossible. The following statistics will show the different possibilities.

Pharmuthi 2 in the 16th Egyptian regnal year was July 12/13 (sr-sr), 449 B.C.; Pharmuthi 3 was July 13/14 (sr-sr). Tammuz 18 would have been one of the three possible dates, July 11/12, 12/13, or 13/14 (ss-ss). The conjunction of the moon took place June 23.92 (10:04 P.M.), and the translation period would have been .83 of a day (19 hours, 55 minutes) if Tammuz 1 was June 24/25, 1.83 days (43 hours, 55 minutes) if Tammuz 1 was June 25/26, and 2.83 days (67 hours, 55 minutes) if Tammuz 1 was June 26/27.

AP 13. Kislev 2 (?) = Mesore 11 (?), year 19 of Artaxerxes I (446 B.C.)

The reproduction of the papyrus[25] shows only two visible strokes of the day number for Kislev, and no room for the third stroke that Cowley considers "probable."[26] Since Kislev 3 would give extremely low translation periods, Kislev 2—also read thus by Hontheim and allowed by

[25] Sayce and Cowley, *op. cit.*, Plate containing "Papyrus E, 1-13."
[26] Cowley, *op. cit.*, p. 38.

Gutesmann as possible[27]—is most probably the correct Jewish date.

There are only faint traces of the figure that goes with the Egyptian month Mesore. Cowley, who had the original before him, read 10,[28] but from the published facsimile one could also read 11,[29] in which case the translation period for Kislev 2 would be reasonable, as the following will show.

Mesore 11 was Nov. 18/19 (sr-sr), 446 B.C., and Kislev 2 was consequently Nov. 17/18 (ss-ss) or Nov. 18/19 (ss-ss). Since the conjunction took place Nov. 16.25 (6:00 A.M.), the translation period was .50 of a day (12 hours) if Kislev 1 was Nov. 16/17 (ss-ss), or 1.50 days (36 hours) if Kislev 1 was Nov. 17/18 (ss-ss).

This papyrus is important, since it shows that the Jews had not inserted a second Elul during that year. Parker and Dubberstein have in their tables an unattested second *Ululu* in the Babylonian calendar for the year 446/5 B.C.[30] However, since no complete regularity existed in the insertion of second *Ululus* in the Babylonian calendar before the 4th century, we are not sure that there was a second *Ululu* in the Babylonian calendar in that year. This uncertainty with regard to unattested intercalary months is demonstrated by two recently published tablets from Ur,[31] which show that a second *Ululu* was inserted in the Babylonian calendar in the year 409 B.C. instead of 408 and another one in 621 B.C. instead of 622 as Parker and Dubberstein's tables have it.[32]

If it could be shown that the Babylonians had a second *Ululu* in 446/5 B.C., we would have a proof that the Jews did not intercalate by the use of a second Elul, but only by employing a second Adar. As the matter stands now, it

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[27] *Ibid.*
[28] *Ibid.*
[29] Sayce and Cowley, *op. cit.*, Plate containing "Papyrus E, 1-13."
[30] Parker and Dubberstein, *op. cit.*, p. 30.
[31] Figulla, *op. cit.*, p. 6 (nos. 202 and 93).
[32] Parker and Dubberstein, *op. cit.*, pp. 25, 32.

can only be stated that no proof can be given that the Jews ever used a second Elul, but to prove that they never did so is not yet possible.

AP 14. Ab 14 = Pachons 19, year 25 of Artaxerxes I (440 B.C.)

Pachons 19 in the 25th Egyptian year of Artaxerxes was Aug. 26/27 (sr-sr), 440 B.C., and Ab 14 either Aug. 25/26 (ss-ss) or Aug. 26/27 (ss-ss). The conjunction of the moon occurred Aug. 12.81 (7:26 P.M.). If Ab 1 was Aug. 12/13 (ss-ss), it would have begun even .06 of a day (1 hour, 26 minutes) *before* the actual conjunction took place, which is unthinkable. If Ab 1 was Aug. 13/14 (ss-ss), the translation period would have been of a more reasonable length, .94 of a day (22 hours, 33 minutes).

Kraeling 3. Elul 7 = Payni 9, year 28 of Artaxerxes I (437 B.C.)

Payni 9 in Artaxerxes' 28th Egyptian year was Sept. 14/15 (sr-sr), 437 B.C., and Elul 7 consequently either Sept. 13/14 (ss-ss) or Sept. 14/15 (ss-ss). Since the conjunction occurred Sept. 7.55 (1:12 P.M.), the translation period would have been only .20 of a day (4 hours, 48 minutes) if Elul 1 was Sept. 7/8 (ss-ss), but the more reasonable length of 1.20 days (28 hours, 48 minutes) if Elul was Sept. 8/9 (ss-ss).

AP 10. Kislev 7 = Thoth 4, year [2]9 of Artaxerxes I (437 B.C.?)

The papyrus is perfectly preserved and offers no reading difficulties. However, its year number 9 seems to be a mistake for 29 since in all the regnal years of Artaxerxes I Kislev 7 agrees with Thoth 4 only in his 4th[33] and 29th Egyptian years.

[33] Since it is easier to assume that the scribe made a mistake by writing a 9 instead of a correct 29 for the year number, no consideration is given in the text

Thoth 4 in Artaxerxes' 29th Egyptian regnal year was Dec. 13/14 (sr-sr), 437 B.C., and therefore Kislev 7 either Dec. 12/13 (ss-ss) or Dec. 13/14 (ss-ss). The conjunction of the moon took place Dec. 5.74 (5:45 P.M.), and the translation period amounted to 1.01 days (24 hours, 14 minutes) if Kislev 1 was Dec. 6/7 (ss-ss), or 2.01 days (48 hours, 14 minutes) if Kislev 1 was Dec. 7/8 (ss-ss), 437 B.C.

If the year 29 is a correct reconstruction of the date of this papyrus, it was written in the same Julian calendar year as the preceding papyrus (*Kraeling 3*), although the regnal years differed, the 1st of Thoth being a turning point for the beginning of a new regnal year in Egypt. In this way they check one against the other. It is only unfortunate that the year number 29 is a conjecture, although one based on good evidence.

AP 15. [Tishri 25] = Epiphi 6, year [30] of [Artaxerx]es I (435 B.C.?)

The first line, containing the date, is badly damaged. Epiphi 6 is preserved, but although the reading "Tishri 25" fits the poor remnants of some visible letters, it is far from certain that the reconstruction proposed here presents the correct or only possible reading. Nothing remains of the year number, and only the last letter remains of the king's name, which must have been Artaxerxes I, as the contents of the document show.[34] Although no weight can be placed on the results obtained from any computation about this papyrus, they are nevertheless presented here for the sake of completeness.

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to the other possibility that he wrote a mistaken 9 instead of the number 4. But for completeness' sake the computations for year 4 will be given here. Thoth 4 in the 4th Egyptian regnal year of Artaxerxes I was Dec. 20 (sr-sr), 462 B.C. Consequently Kislev 7 would have been either Dec. 19/20 (ss-ss) or Dec. 20/21 (ss-ss). Since the conjunction had occurred Dec. 12.53 (12:43 P.M.), the translation period would have amounted to 1.22 days (29 hours, 16 minutes) if Kislev 1 was Dec. 13/14 (ss-ss), or to 2.22 days (53 hours, 16 minutes) if Kislev 1 was Dec. 14/15 (ss-ss).

[34] Cowley, *op. cit.*, p. 44.

A near agreement between Tishri 25 and Epiphi 6 can be obtained only in the years 449 and 435 B.C. For the year 449 a check is provided now by *Kraeling 2,* which is unfortuntely also a broken papyrus. To make both papyri fit, Pharmuthi 3 in *Kraeling 2* would have to be changed to Pharmuthi 2, and Tishri 25 in *AP 15* to Tishri 24.[86] Since the computations for the year 435 B.C. require no such changes, they are presented here.

Epiphi 6 in 435 B.C. was Oct. 11/12 (sr-sr), and Tishri 25 consequently Oct. 10/11 (ss-ss) or Oct. 11/12 (ss-ss). The conjunction of the moon had taken place Sept. 15.44 (10:33 A.M), so that the translation period amounted to 1.31 days (31 hours, 26 minutes) if Tishri 1 was Sept. 16/17 (ss-ss), but 2.31 days (55 hours, 26 minutes) if Tishri 1 was Sept. 17/18 (ss-ss).

Kraeling 4. Tishri 25 = Epiphi 25, year 31 of Artaxerxes I (434 B.C.)

Epiphi 25 in Artaxerxes' 31st Egyptian year was Oct. 30/31 (sr-sr), 434 B.C., and Tishri 25 either Oct. 29/30 (ss-ss) or Oct. 30/31 (ss-ss). The conjunction had taken place Oct. 4.37 (8:52 A.M.), and the translation period amounted therefore to 1.38 days (33 hours, 7 minutes) if Tishri 1 was Oct. 5/6 (ss-ss), or to 2.38 days (57 hours, 7 minutes) if Tishri 1 was Oct. 6/7 (ss-ss).

Kraeling 5. Sivan 20 = Phamenoth 7, year 38 of Artaxerxes I (427 B.C.)

Phamenoth 7 in the 38th Egyptian year of Artaxerxes was June 12/13 (sr-sr), 427 B.C. Since Sivan 20 was therefore either June 11/12 (ss-ss) or June 12/13 (ss-ss), and the

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[86] There are 95 or 96 days in a lunar calendar from Tammuz 18 to Tishri 25, but only 93 from Pharmuthi 3 to Epiphi 6 in the Egyptian solar calendar. To make the two different intervals equal requires therefore a lengthening of one and a shortening of the other. From Pharmuthi 2 to Epiphi 6 are 94 days, and from Tammuz 18 to Tishri 24 are 94 or 95 days.

conjunction of the moon had taken place May 22.21 (5:02 A.M.), the translation period amounted to 1.54 days (36 hours, 57 minutes) if Sivan 1 was May 23/24 (ss-ss), or 2.54 days (60 hours, 57 minutes) if Sivan 1 was May 24/25 (ss-ss).

Kraeling 6. Pharmuthi 8 = Tammuz 8, year 3 of Darius II (420 B.C.)

There is no need to repeat here what has been said concerning this papyrus on pp. 82-86, where it was shown that the dates of this document can be made to agree with each other only if year 3 means the 3d regnal year of Darius II according to a fall-to-fall Jewish calendar.

In the 3d regnal year of Darius II according to Jewish reckoning (but already in the 4th year according to Egyptian reckoning) Pharmuthi 8 was July 11/12 (sr-sr), 420 B.C. Tammuz was therefore either July 10/11 (ss-ss) or July 11/12 (ss-ss). The conjunction had occurred July 2.77 (6:28 P.M.), and the translation period amounted to .98 of a day (23 hours, 31 minutes) if Tammuz 1 was July 3/4 (ss-ss), or to 1.98 days (47 hours, 31 minutes) if Tammuz 1 was July 4/5 (ss-ss).

AP 20. בירח *Elul = Pa[yni], year 4 of Darius II (420 B.C.)*

Although only the first two letters of the word Payni are preserved in the papyrus, this reconstruction is certainly correct; a reconstruction to the alternative month Pha[ophi] is impossible, because Elul and Phaophi lay months apart during the whole 5th century B.C.

Payni 1 in the 4th regnal year of Darius II according to the Egyptian reckoning fell on Sept. 2/3 (sr-sr), 420 B.C. The nearest conjunction to this date occurred Aug. 31.12 (2:52 A.M.), and the 1st of Elul could probably have been counted Sept. 1/2 (ss-ss) with a translation period of 1.63 days (39 hours, 7 minutes), so that September 2 could have been called "first day of the month" if this meaning can

be given to the word ירח. However, the traditional translation of בירח "in the month" also makes sense, since the two months are almost synchronous, and this document, the settlement of a claim, could have been written on almost any day of Elul to synchronize with Payni.

Kraeling 7.* בירח *Tishri = Epiphi, year 4 of Darius II (420 B.C.)

This papyrus was written in the month following the one recorded in *AP 20*. Epiphi 1 was Oct. 2/3 (sr-sr), 420 B.C., and the 1st of Tishri was probably Sept. 30/Oct. 1 (ss-ss), since the conjunction had taken place Sept. 29.83 (7:55 P.M.), which would allow a translation period of .92 of a day (22 hours, 4 minutes). But Tishri 1 could also have been Oct. 1/2 (ss-ss), with a translation period of 1.92 days (46 hours, 4 minutes), so that once more an Egyptian month began at approximately the same time as a Jewish month, and Epiphi 1 could have been called "the first" of Tishri, allowing such a translation for ירח.

Since this papyrus was written in Tishri after the beginning of a new Jewish civil year, and before the close of the Egyptian civil year, the regnal year 4 of Darius was the same according to each one of the three systems in use, as can be seen from Figure 4, on p. 84.

Kraeling 8. Tishri 6 = Payni 22, year 8 of Darius II (416 B.C.)

Inasmuch as the Egyptian month Payni synchronized with the month Elul in the 4th Egyptian year of Darius (*AP 20*), it is impossible for the same month to coincide with Tishri four years later. However, harmony can be achieved between Tishri 6 and Epiphi 22 in the 8th regnal year of Darius II. Hence it can be assumed that the scribe made a mistake in writing Payni instead of the next month Epiphi.

Epiphi 22 fell on Oct. 22/23 (sr-sr), 416 B.C., and Tishri 6 consequently on either Oct. 21/22 (ss-ss) or Oct. 22/23 (ss-ss). The conjunction had taken place Oct. 14.71 (5:02 P.M.), so that the translation period had a length of 2.04 days (48 hours, 57 minutes) if the 1st of Tishri was Oct. 16/17 (ss-ss). That Tishri 1 could have been Oct. 17/18 (ss-ss) is almost impossible, since the translation period in that case would have amounted to 3.04 days (72 hours, 57 minutes).

Another possibility would be to assume a mistake in the Jewish rather than the Egyptian month name, that is, to read Elul instead of Tishri. In that case Payni 22 would stand, which was Sept. 22/23 (sr-sr), 416 B.C., and Elul 6 would be either Sept. 21/22 (ss-ss) or Sept. 22/23 (ss-ss). The conjunction took place Sept. 15.23 (5:31 A.M.), allowing a translation period of 1.52 days (36 hours, 28 minutes) if Elul 1 was Sept. 16/17 (ss-ss), or of 2.52 days (60 hours, 28 minutes) if Elul 1 was Sept. 17/18 (ss-ss).

However, it is very unlikely that the scribe made the mistake of writing Tishri instead of Elul, since Tishri follows Elul, and it is very unusual to fall into the mistake of confusing a future month with the current one. It is, however, a common mistake to write the name of a past month instead of the new one. This would have happened here if the scribe mistakenly continued to write Payni although he was already living in Epiphi, the next month.

AP 25. Kislev 3, year 8 = Thoth 12, year 9 of Darius II (416 B.C.)

This papyrus and the following are exceptionally important for the fact that they record the regnal year of Darius according to both Jewish and Egyptian reckonings. This was not done in all cases where the years actually differ.[36]

[36] See the discussion on pp. 80, 81.

Thoth 12 in the 9th Egyptian year of Darius II was Dec. 16/17 (sr-sr), 416 B.C., and therefore Kislev 3 in either the 8th Jewish or the 8th Persian year was Dec. 15/16 (ss-ss) or Dec. 16/17 (ss-ss). The conjunction of the moon took place Dec. 12.98 (11:31 P.M.), which time allows a translation period of .77 of a day (18 hours, 28 minutes) if Kislev 1 was Dec. 13/14 (ss-ss), or of 1.77 days (42 hours, 28 minutes) if Kislev 1 was Dec. 14/15 (ss-ss).

AP 28. Shebat 24, year 13 = Athyr 9, year 14 of Darius II (410 B.C.)

Athyr 9 fell on Feb. 10/11 (sr-sr), 410 B.C., in the 14th Egyptian regnal year of Darius II, which makes Shebat 24 either Feb. 9/10 (ss-ss) or Feb. 10/11 (ss-ss). The conjunction took place Jan. 17.13 (3:07 A.M.), and the translation period amounted to .62 of a day (14 hours, 52 minutes) if the 1st of Shebat was Jan. 17/18 (ss-ss), or to 1.62 days (38 hours, 52 minutes) if Shebat 1 was Jan. 18/19 (ss-ss).

The two papyri last mentioned, *AP 25* and *AP 28*, show clearly that the scribes who wrote these documents employed different systems of reckoning the regnal years of their Persian overlords, one according to the Egyptian and the other according to the Jewish system. They were not always consistent enough to mention both years, when a difference existed, as in *AP 10* which mentions the same Jewish and Egyptian months as *AP 25*, as has already been discussed.[87]

Kraeling 9. Marcheshvan 24 = Mesore 29, year 1 of Artaxerxes II (404 B.C.)

There are no contemporary tablets of the last six years of Darius II, or of the accession year of Artaxerxes II. Therefore we have heretofore depended on Ptolemy's Canon and the Saros Tablet for fixing the first year of

[87] See pp. 80, 81.

Artaxerxes II.[39] The dates thus reached are now verified and corroborated by this new double-dated papyrus and the next one.

The first regnal year of Artaxerxes II according to Ptolemy's Canon was the 344th year of the Nabonassar era, beginning with Thoth 1 on Dec. 2, 405 B.C. Mesore 29 fell therefore on Nov. 25/26 (sr-sr), 404 B.C., and Marcheshvan 24 was consequently either Nov. 24/25 (ss-ss) or Nov. 25/26 (ss-ss). The conjunction occurred Nov. 1.43 (10:19 A.M.) and the translation period was therefore .32 of a day (7 hours, 40 minutes) if Marcheshvan 1 was Nov. 1/2 (ss-ss), or 1.32 days (31 hours, 40 minutes) if Marcheshvan 1 was Nov. 2/3 (ss-ss).

Kraeling 10. Adar 20 = Choiak 8, year 3 of Artaxerxes II (402 B.C.)

Choiak 8 of the 3d regnal year of Artaxerxes II according to Egyptian reckoning fell on March 9/10 (sr-sr), 402 B.C. Adar 20 was then either March 8/9 (ss-ss) or March 9/10 (ss-ss), and Adar 1 either Feb. 17/18 (ss-ss) with a translation period of .90 of a day (21 hours, 36 minutes) or Feb. 18/19 (ss-ss) with a translation period of 1.90 days (45 hours, 36 minutes), since the conjunction had taken place Feb. 16.85 (8:24 P.M.).

Conclusions

The results obtained from the study of the double-dated papyri are very instructive. However, not all the documents discussed so far can be used for a reconstruction of the Jewish calendar of the 5th century B.C.

Two of them, *AP 8* and *AP 10,* obviously contain errors, since their dates, as given, cannot be made to agree by any known method of computation. It is uncertain whether

[39] Parker and Dubberstein, *op. cit.*, p. 16.

the corrections proposed above are sound, especially for *AP 8,* since the correction leads to conclusions that are at variance with a regular intercalation like that of the 19-year cycle.

Two other papyri, *Kraeling 14* and *AP 15,* are so badly broken that great parts of the date lines have been reconstructed without certainty that the reconstruction is correct. Since the conclusions reached in this way show once more a divergence from the 19-year cycle, it is safer not to rely on the results reached through reconstructed date lines.

Documents that contain no day number, as the *Cairo Sandstone Stele, AP 20,* and *Kraeling 7,* are valuable in supporting the over-all picture, but cannot be used for an exact reconstruction of the Jewish calendar.

On the other hand, some broken documents have certainly been correctly reconstructed (*AP 6, Kraeling 2*), and the mistake in *Kraeling 8,* where the scribe evidently wrote an erroneous Payni instead of a correct Epiphi, can be easily detected. Hence it is valid to use these three last-mentioned documents as evidence in the conclusions to be reached below.

Table 2 offers a comparison of the results achieved from the study of the several papyri that can be used as reasonably trustworthy evidence. For each document the table presents the Egyptian date with its Julian equivalent; then it gives the Jewish month with the two possibilities of its Julian equivalent, the first date being correct if the document was written during the day, the second one if the document was written after sunset. The translation periods added indicate how much time elapsed from the conjunction of the moon until the evening of the day when the 1st of the month began. Dates resulting from a reasonable translation period are starred.

Table 2 shows that six dates arrived at from the 14 papyri will give reasonable translation periods only if one

assumes that they were written after sunset; the other 8 could have been written during the hours of daytime. Five of the dates starred differ by one day from those given in Parker and Dubberstein's *Babylonian Chronology*. This difference of about 35 per cent can be accounted for by the fact that for the Babylonian dates complete accuracy cannot be achieved, for reasons already set forth.[39]

Nevertheless the close harmony with the Babylonian calendar is striking. Since most translation periods have a low tendency, there is the possibility that the Jews in Elephantine did not entirely rely on the observation of the new crescent to determine the beginning of the new month. But the paucity of our source material makes it uncertain whether the Jews had developed, through a long period of experimentation and observation, a fixed calendar in which the number of days of each month had been calculated beforehand. The comparatively low translation periods can perhaps be explained by the fact that Elephantine knows hardly any overcast sky, and therefore a new crescent can easily be observed as soon as it reaches the minimum elevation of visibility.

Unfortunately our papyri do not contain the names of any intercalary months, and we are not yet in a position to prove, as Jewish scholars have always maintained, that the Jews used only a second Adar, but never a second Elul *AP 13* shows only that no second Elul was inserted in year 446 B.C., where Parker and Dubberstein's *Babylonian Chronology* contains an unattested *Ululu II*.[40] As long as this Babylonian *Ululu II* remains unattested, the fact that the Jews definitely used no second Elul during that year is no proof that they never did so, although the assumption

[39] See pp. 34, 35. A 20 per cent inaccuracy of Parker and Dubberstein's tables can be demonstrated by an actual check of published cuneiform business documents (from Nabopolassar to Artaxerxes I) that happen to be dated on the 30th of various months. Of 73 such 30-day months thus attested, 15 are given a length of only 29 days in the tables of Parker and Dubberstein's *Babylonian Chronology*.

[40] Parker and Dubberstein, *op. cit.*, p. 30.

No. of Papy-rus	Year B.C.	EGYPTIAN DATE		Jewish month & day	JEWISH DATE			
					If written during day		If written after sunset	
		Egyptian month & day	Julian month & day		Julian month & day	Translation Period[a]	Julian month & day	Translation Period[a]
AP 5	471	Pach. 28	Sept. 12/13	Elul 18	*Sept. 11/12	23 hrs. 17 min.	Sept. 12/13	47 hrs. 17 min.
AP 6	464	Tho. 17	Jan. 2/3	Kisl. 18	*Jan. 1/2	17 " 2 "	Jan. 2/3	41 " 2 "
Kr 1	451	Pham. 25	July 6/7	Siv. 20	July 5/6	3 " 50 "	*July 6/7	27 " 50 "
Kr 2	449	Phar. 3	July 13/14	Tam. 18	*July 12/13	19 " 55 "	July 13/14	43 " 55 "
AP 13	446	Mes. 11	Nov. 18/19	Kisl. 2	Nov. 17/18	12 " 0 "	*Nov. 18/19	36 " 0 "
AP 14	440	Pach. 19	Aug. 26/27	Ab 14	Aug. 25/26	(-1 " 26 ")[b]	*Aug. 26/27	22 " 33 "
Kr 3	437	Pay. 9	Sept. 14/15	Elul 7	Sept. 13/14	4 " 48 "	*Sept. 14/15	28 " 48 "
Kr 4	434	Epi. 25	Oct. 30/31	Tish. 25	*Oct. 29/30	33 " 7 "	Oct. 30/31	57 " 7 "
Kr 5	427	Pham. 7	June 12/13	Siv. 20	*June 11/12	36 " 57 "	June 12/13	60 " 57 "
Kr 6	420	Phar. 8	July 11/12	Tam. 8	*July 10/11	23 " 31 "	July 11/12	47 " 31 "
AP 25	416	Tho. 12	Dec. 16/17	Kisl. 3	*Dec. 15/16	18 " 28 "	Dec. 16/17	42 " 28 "
AP 28	410	Ath. 9	Feb. 10/11	Sheb. 24	Feb. 9/10	14 " 52 "	*Feb. 10/11	38 " 52 "
Kr 9	404	Mes. 29	Nov. 25/26	Mar. 24	Nov. 24/25	7 " 40 "	*Nov. 25/26	31 " 40 "
Kr 10	402	Choi. 8	March 9/10	Adar 20	*March 8/9	21 " 36 "	March 9/10	45 " 36 "

* Dates resulting from a reasonable translation period.

[a] The time between the conjunction of the moon and the evening with which the first day of the month began.

[b] In this case the beginning of the month would have occurred 1 hr. 26 min. before conjunction; hence the minus sign.

Table 2

seems plausible that they would have been reluctant to lengthen the interval between the great feasts of Nisan and those of Tishri.

However, one important aspect of these papyri is the proof that *Kraeling 6* gives of the existence of the civil fall-to-fall calendar among the 5th century Jews at Elephantine. Since this papyrus supports statements made in Nehemiah 1:1 and 2:1, implying the existence of such a calendar among postexilic Jewry, there is no reason left for doubt concerning the correctness of the date line of *Kraeling 6*, and the alternative assumption that a scribal error is involved must be rejected.

These papyri provide most welcome material for a reconstruction of some phases of the Jewish calendar of the pre-Christian era, for which no other source material is available except the meager information the Bible provides. Yet the small number of documents available as witnesses is far too scanty to arrive at unassailable conclusions as to every aspect of their lunar calendar.

However, the recent discovery of additional source material on which the foregoing conclusions have been based allows us to entertain reasonable hope that further data will fill the still existing gaps and permit a more complete reconstruction of the ancient Jewish calendar system.

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